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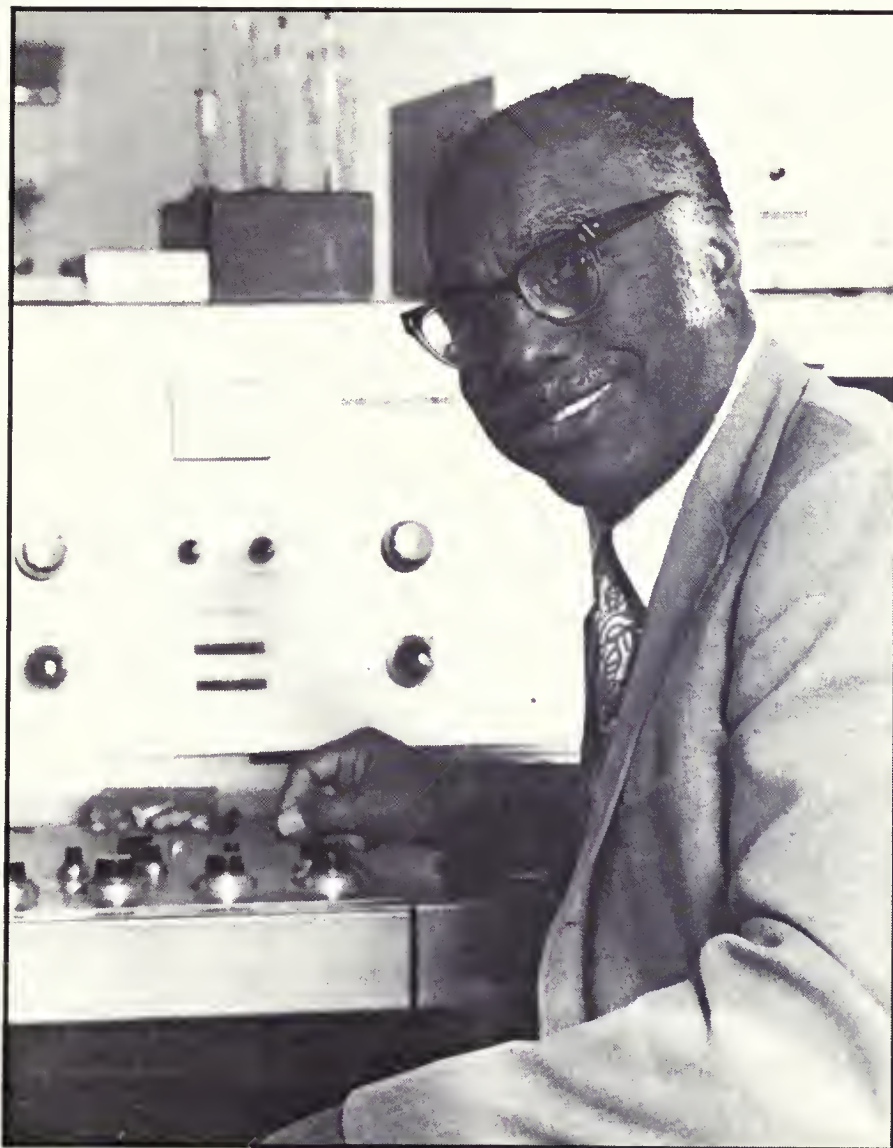












Lloyd Noel Ferguson, circa 1984.



Since 1954 the Regional Oral History Office has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the Nation. Oral history is a modern research technique involving an interviewee and an informed interviewer in spontaneous conversation. The taped record is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The resulting manuscript is typed in final form, indexed, bound with photographs and illustrative materials, and placed in The Bancroft Library at the University of California, Berkeley, and other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

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to the following individuals and organizations  
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## PREFACE

In America, education has long been an important avenue of opportunity. From our earliest years young people and their families have looked to the nation's colleges and universities to provide the knowledge and experience that will enable the new generation to take its place in the world of work and government and creative activity. In turn, one measure of the quality of American universities and colleges is the breadth and diversity of their students, including how well they reflect the mix of social, racial, and economic backgrounds that make up the communities from which they come and in which they will take part as graduates.

On the West Coast, the University of California at Berkeley has from its beginnings in the 1860s welcomed the sons and daughters of small farmers and shopkeepers, railroad workers and laborers, as well as the children of lawyers and doctors, corporate executives, from many ethnic and racial groups. By 1900, the first black students had enrolled at Berkeley, pioneers of yet another group of Americans eager to seek the best in higher education and to broaden their participation in the life of California and the nation.

Those first black students to come to Cal were indeed on their own, with few fellow black students and no special programs or black faculty to guide them or serve as role models. During the Great Depression of the 1930s a few more came, maybe a hundred at a time in all. The education benefits of the G.I. Bill for men and women who did military service during World War II opened the doors to many more black students to attend Cal in the late 1940s and early 1950s. A census taken in 1966 counted 226 black students, 1.02 percent of all the students at Berkeley. By the fall of 1988, there were 1,944 black graduate and undergraduate students, 6.1 percent of the student body. With changing population and immigration patterns in recent years, as well as active campus recruiting programs, for the first time there is not a single majority ethnic group in the entire undergraduate student body at Berkeley.

Looking back from the 1990s, those early trailblazers are very special. Though few in number, a large percentage of them have gone on to distinguished careers. They have made significant contributions in economics, education, medicine, government, community service, and other fields. It is fitting that a record of their initiative and energy be preserved in their own accounts of their expectations of the University of California, their experiences as students there, and how these experiences shaped their later lives. Their stories are a rich part of the history of the University.



Since 1970, the University has sought to gather information on this remarkable group of students, as noted in the following list of oral histories. In 1983, the UC Black Alumni Club and University officials began planning an organized project to document the lives and accomplishments of its black graduates. In order to provide scholars access to the widest possible array of data the present series includes oral histories conducted for Regional Oral History Office projects on California Government History Documentation and the History of Bay Area Philanthropy, funded by various donors.

With the advice and assistance of the Black Alumni Club, the Chancellor's Office, and the support of other alumni and friends of the University, the Regional Oral History Office of The Bancroft Library is tape-recording and publishing interviews with representative black alumni who attended Cal between the years 1920 and 1956. As a group, these oral histories contain research data not previously available about black pioneers in higher education. As individuals, their stories offer inspiration to young people who may now be thinking of entering the University.

The Regional Oral History Office was established in 1952 to tape record autobiographical interviews with persons significant in the history of California and the West. The Office is under the administrative direction of The Bancroft Library and Willa Baum, Division Head. Copies of all interviews in the series are available for research use in The Bancroft Library and UCLA Department of Special Collections. Selected interviews are also available at other manuscript depositories.

Gabrielle Morris, Director  
University of California Black Alumni Project

Willa K. Baum, Division Head  
Regional Oral History Office

May 1992  
Regional Oral History Office  
The Bancroft Library  
University of California, Berkeley



UNIVERSITY OF CALIFORNIA BLACK ALUMNI SERIES

Interviews completed or in process as of November 1992

Allen Broussard, On the California Courts, in process.

Lloyd Noel Ferguson, Increasing Opportunities in Chemistry, 1936-1986, 1992.

Walter Gordon, Athlete, Officer in Law Enforcement and Administration, Governor of the Virgin Islands, 1980.\*

Ida Jackson, Overcoming Barriers in Education, 1990.

John Miller, "Issues of Criminal Justice and Black Politics in California," in Legislative Issue Management and Advocacy, 1961-1974, 1983.\*

Charles Patterson, On Oakland Economic Development and Philanthropy, in process.\*

Tarea Hall Pittman, NAACP Official and Civil Rights Worker, 1974.\*

Marvin Poston, Making Opportunities in Vision Care, 1989.

Emmett J. Rice, Education of an Economist: From Fulbright Scholar to the Federal Reserve Board, 1951-1979, 1991.

William Byron Rumford, Legislator for Fair Employment, Fair Housing, and Public Health, 1973.\*

Archie Williams, The Joy of Flying: Olympic Gold, Air Force Colonel, and Teacher, in process.

Lionel Wilson, Attorney, Judge, and Oakland Mayor, 1992.

\*Interviews conducted for other Regional Oral History Office projects, funded by various donors.





## INTERVIEW HISTORY--Lloyd Noel Ferguson

When Professor Lloyd Ferguson retired from California State University at Los Angeles in 1986 after twenty years on the faculty, several of them as chairman of the chemistry department, and returned to Northern California, the Regional Oral History Office welcomed the opportunity to interview him for the University of California Black Alumni Project. His memoir provides lively anecdotes of Berkeley student life in the thirties, including camaraderie with Nobel Laureates Melvin Calvin and Glenn Seaborg, then young instructors, and insights into the development in the late 1950s and 1960s of national programs to encourage and support minority students in pursuing science-based careers, efforts in which Dr. Ferguson played key roles.

Growing up in Oakland, young Lloyd enjoyed school and backyard chemical experiments and was urged by his parents and teachers to go on to college. He delivered newspapers and redcapped for the Southern Pacific Railway to make money for expenses and began his studies after saving enough for tuition. There were racial slights with which he became more familiar as he grew older, and which he seems to have learned to put aside, but he had no difficulty in 1936 enrolling in the University of California at Berkeley.

He did well at Cal and shared the intellectual excitement of the years when basic discoveries in atomic energy were being made on the campus. As a graduate student, he would prepare chemicals through radiation emitted by the pioneer cyclotron in Donner Laboratory. In 1943, Dr. Ferguson became the first African American to receive a Ph.D. in chemistry from the university.

His academic career took him from North Carolina Agricultural and Technical College to Howard University and then to Cal State Los Angeles, with sabbaticals along the way in Denmark, Switzerland, and East Africa. When his first book was published in 1952, Dr. Ferguson was invited to become a member of an American Chemical Society panel, beginning what he refers to as "a fortunate cycle" of events. This association led to many years of distinguished service in several national programs for improving science education. In addition to the ACS summer projects for minority students, he has been on National Institutes of Health advisory committees and testified before key congressmen to urge funding for minority student grant programs.



From frequent references in the oral history to his wife and children, as well as colleagues and students he has encouraged, it is clear that Dr. Ferguson enjoys people. His years of effort in improving teaching and career opportunities in chemistry also testify to his energy and capacity for hard work.

The following interview with Dr. Ferguson was recorded in the Regional Oral History Office on August 3, 1992. The tapes were transcribed and the transcript lightly edited and sent to Dr. Ferguson for review. He went over the manuscript carefully, making revisions of names and other details as necessary and revising a few technical passages for clarity. In mid-October 1992, a few final stylistic questions were resolved in a telephone call.

Gabrielle Morris  
Interviewer-Editor

October 30, 1992  
Regional Oral History Office  
The Bancroft Library  
University of California, Berkeley



## BRIEF CHRONOLOGY--LLOYD NOEL FERGUSON

February 9, 1918 - born, Oakland, California

1940 - B.S., University of California, Berkeley, with honors

1943 - Ph.D., UC Berkeley, research assistant on national defense project to Melvin Calvin

1944-45 - faculty at North Carolina A & T College

1945-65 - Howard University faculty; chair, Department of Chemistry; helped initiate Howard's first Ph.D. program, in chemistry. Research in organic chemistry and in the sense of taste

1953-54 - Guggenheim Fellow at Carlsberg Laboratorium, Copenhagen

1956 - touring lecturer, visiting scientist, American Chemical Society programs

1961-62 - National Science Foundation Faculty Fellow in Swiss Federal Institute of Technology, Zurich

1965 - joined faculty of California State University, Los Angeles; maintained research program in physical organic chemistry involving more than fifty publications and seven textbooks

1966-70 - member, Food & Drug Administration panel on research guidelines

1968 - participated in formulation of SEED program [Support for the Educationally and Economically Disadvantaged] of the ACS

1968-71 - chair, Department of Chemistry, CSULA

1971-72 - visiting professor, University of Nairobi

1972 - co-founder, National Organization of Black Chemists and Chemical Engineers

1972-75 - National Cancer Institute Chemotherapy Advisory Committee

1974 - CSU Outstanding Professor Award



1973-84 - program director, NIH Minority Biomedical Research Program at CSULA

1980 - national chair, ACS Division of Chemical Education

1983 - chair ACS Southern California Section

1986 - Retired from CSULA; scholarship named in Dr. Ferguson's honor

1983 - Smithsonian Living History presentation notes "his research on the sense of taste, on structure-bioactivity relationships and on cancer chemotherapy . . . give evidence of the tremendous contributions Lloyd Noel Ferguson has made to his profession"

1991 - relocated to northern California





Regional Oral History Office  
Room 486 The Bancroft Library

University of California  
Berkeley, California 94720

# BIOGRAPHICAL INFORMATION

(Please write clearly. Use black ink.)

Your full name Lloyd Noel Ferguson  
 Date of birth Feb. 9, 1918 Birthplace Oakland, CA  
 Father's full name Noel Swithin Ferguson  
 Occupation Insurance clerk Birthplace Kingston, Jamaica  
 Mother's full name Gwendolyn Louise Johnson Ferguson  
 Occupation Elevator operator Birthplace Oakland, CA  
 Your spouse Charlotte Olivia Welch Ferguson  
 Occupation Retired teacher Birthplace Texarkana, Ark.  
 Your children Lloyd Jr.; Stephen Bruce;  
Lisa Annette  
 Where did you grow up? Oakland, CA  
 Present community Fair Oaks, CA  
 Education B.S. 1940, Ph. D. 1943, Univ. of Calif. Berkeley  
Post Doctorate; Carlsberg Lab Copenhagen, Denmark  
 Occupation(s) E.T.H. Zuilich, Switzerland  
Prof. Org. Chem., Calif. State Univ. L.A., Howard Univ.,  
Univ. of Oregon, A + T College, Greensboro, Univ. Nairobi, Kenya  
U.S. Govt Chemist Dept Agriculture, Nat. Bur. Standards, Naval Ordnance  
 Areas of expertise Chemistry of Taste; Correlations of  
organic structural and bioorganic properties;  
Chemical education; cancer chemotherapy.  
(post retirement)  
 Other interests or activities Travel, especially cruises;  
bridge, chess, movies  
 Post-retirement  
 Organizations in which you are active Nat. Org. Black Chemists;  
Sigma Pi Phi Fraternity; Amer. Chem. Soc.



# I FAMILY AND YOUTH

[Date of interview: August 3, 1992]##'

## Growing up in Oakland, California

Morris: As you can see from the outline I sent, my questions will be generally in chronological order.

Ferguson: Your outline was very helpful. I've made a few notes that sort of follow what you sent me.

Morris: Good. You are well prepared. That must be the result of all your years in the academic business.

Why don't we start out with growing up. You were born here in Oakland?

Ferguson: Yes, in 1918. My parents often worked away from home so I was raised by my grandparents until I was old enough to stay alone during the day. That was probably during my high school days. When my parents did buy a home, it wasn't far from my grandparents' place. It was just a block and a half away so I could run back and forth.

I always liked school. I couldn't wait until the summer was over to begin again.

Morris: Good for you. Were you the eldest child in your family?

Ferguson: I am the only child. I went to the school in the neighborhood. I was frequently a so-called teacher's helper. I would get the books and supplies and help her pass them out and sometimes serve as a traffic monitor. For elementary school, I went to Longfellow School. Just about the time for junior high, there

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<sup>1</sup> This symbol indicates the start of a new tape or tape segment. For a guide to tapes, see page following text.



was a new school built, Hoover Junior High, right in my neighborhood, a block away, so I went to that school. Then I went to Oakland Tech High.

Morris: Did your grandparents and parents come to California together?

Ferguson: No, I'm a third-generation Californian. My mother [Gwendolyn Johnson Ferguson] was born in Oakland, California, and my grandmother [Esther Farrell Johnson] was born in San Francisco. Actually, my mother hadn't been out of California until she came to visit me when I was working in Washington, D.C., teaching at Howard University. By that time, my father [Noel Swithin Ferguson] had passed and my grandparents had passed. I liked California throughout my childhood.

Morris: So your grandparents had settled in Oakland?

Ferguson: Yes.

Morris: What kind of work did your parents do?

Ferguson: My grandfather [William A. Johnson] was a teller in a bank. My father worked as a clerk for an insurance office. Somehow, I was unaware of some of the economic conditions for African Americans because my grandparents and eventually my parents owned their own home until the Depression. Then my father lost his job because of the Depression and wasn't able to get a steady job after that, which was a hardship on the family. That's one reason why I didn't go to college when I first graduated. I started working.

#### High School Work Experience

Ferguson: In fact, I worked while going to high school. I had a large paper route.

Morris: Did you deliver the Oakland Tribune?

Ferguson: The Oakland Tribune, yes. A big route, over a hundred papers.

Morris: I hope it was in the flat part of town.

Ferguson: Yes. Right around North Oakland, which was where I lived. Then after high school, I started working on a WPA [Works Progress Administration] job and kept my paper route. Later, I started



redcapping. No. Before that, I started working at Nash Motor Company, so I dropped the WPA. Then, I started redcapping.

Morris: What did you do for the WPA?

Ferguson: I worked as a laborer. We started the Berkeley marina.

Morris: Did you have relatives who worked for the railroad who got you the redcapping job?

Ferguson: No. I don't recall how I was introduced to Myron King, the captain of the red caps. He was very instrumental in trying to help young fellows who wanted to go to college. We worked for the Southern Pacific Railroad Company, earning wages and tips for assisting travellers. The hours were flexible and enabled several of us to attend college.

#### Introduction to Chemistry: Young Entrepreneur

Ferguson: I discovered that I could make enough money to support myself and help the family financially and still go to college. So I dropped those other jobs and continued redcapping and started Cal in 1936, which was two years after I had graduated from high school.

Morris: You must have graduated really young. I have your birthdate as 1918.

Ferguson: Yes, at sixteen. As I said--I didn't say it. [chuckles] I was out of school for a year because of illness when I was seven or eight years old. I had diphtheria and pneumonia and so it was about a full year, much of that time in the hospital.

Morris: You were lucky. Diphtheria used to take a lot of children.

Ferguson: Right. My mother worked for a physician, serving parties and so forth. He immediately took charge and I came through okay. After that, I was lucky to skip several grades. I skipped half of the third, half of the fourth, half of the fifth and half of the seventh grades and graduated when I was sixteen from high school. It just so happens that my wife [Charlotte Welch Ferguson] was sixteen, and my two sons [Lloyd, Jr. and Stephen] were also sixteen when they graduated from high school, and my daughter [Lisa] was seventeen. So we've all just sort of gone through in a hurry.





Morris: There is a comment here that you were interested in chemistry even before you got to high school.

Ferguson: Yes. Somewhere around eighth or ninth grade, I bought a chemistry set and fell in love with chemistry, particularly when I learned how to make gunpowder and other exciting substances. I took chemistry in high school as soon as I got there. The teacher was very inspirational. We got along well. Actually, the year before I graduated I became her helper. After school I would help her set up the next day's experiments and so forth.

Morris: That's a great way to learn.

Ferguson: Yes. I earned twenty-five cents an hour. At that time, I also built a little shack in the back yard where I could do experiments. I wrote a little chemistry leaflet in which I described lab experiments and some discussion of basic theory, and included a chemical crossword puzzle. I advertised in it, typed it up, and so forth.

Morris: Did you sell advertising in the booklet?

Ferguson: No, but I did advertise my own products. As soon as I learned some things in high school chemistry, I had four products that I made up and sold to the neighbors. Moth-O, which is a moth repellent; it was something you would hang up in the closet. The neighbors bought it as fast as I made it because it was convenient. Rather than throwing the mothballs in the drawers and things like that, they could just hang this up in the closet. I made Clean-O, which was a spot remover, you know, on clothes or fabrics. I made Prest-O, which was a silverware cleaner. And it works, even now sometimes I use it.

Morris: Do you still brew up some of these things?

Ferguson: No. But for the Prest-O it's convenient to use sometimes when I have certain forms of silverware I want to polish.

Morris: Right, but you still use your own compound?

Ferguson: Yes, that Prest-O. That's about the only one.

Morris: That sounds as if you could have sold it to a manufacturing company.

Ferguson: I considered that. Of course, this was high school days and I just didn't know enough about how to push it or get a company to take it over and so forth.



The fourth thing I made was Lem-O--all you had to do was add water to make lemonade.

Morris: You were ahead of your time.

Ferguson: Well, I had a lot of fun at the so-called Ferguson's Chemical Laboratory. From there, naturally, when I got a chance, I started in chemistry at Cal in 1936.

Morris: Who was the teacher who was encouraging to you? Your high school chemistry teacher?

Ferguson: In high school? Gee, I should remember her name because for years, we corresponded. Miss Forsythe. Ruth Forsythe. She retired in Gilmore.



## II UNIVERSITY OF CALIFORNIA, 1936-1944

Race Relations: Working as a Redcap

Morris: Were there many other African American kids in high school in Oakland when you were at Tech?

Ferguson: Not really. This was before the war years. There weren't really many African Americans in the Bay Area, maybe 10,000 altogether. Many of those, or maybe most of them, were in San Francisco. I don't know what the percentages might have been. In junior high school days and beginning high school days, I had a lot of white friends. Occasionally, the blacks would go to parties given at the white kids' houses. I had one very good friend who we agreed he would go to the junior high of my choice and I would go to the high school of his choice. So he came to Hoover Junior High, although it was a little bit out of his way, but then by the time we finished junior high, our friendship had sort of fallen off. I guess I had begun to drift more with black friends and so forth so I didn't go to the high school of his choice.

In college, I might point out--. I have never had a black teacher in K-12 or undergraduate or graduate school. In college, there was never a black student in my class other than one engineering class that I took. It was just sort of a white world. I noticed in my Cal yearbook, there were only eight African Americans in class of 1940 which had 1874 members.

Morris: In the graduating class.

Ferguson: Right. When you looked through the yearbook, you would just see a white world.

Morris: Did that bother you as you were growing up?

Ferguson: It didn't bother me. In school, I associated with them a lot.



Of course, now, all through undergraduate school I was redcapping. It was a convenient job for going to college because the hours were six to ten in the morning and six to ten at night. The trains coming from the East, coming into Oakland, with most of the passengers going to San Francisco. So the redcaps would handle the baggage to and fro across the San Francisco Bay.

Morris: You would take it all the way into the city on the ferry.

Ferguson: On the ferries, right, and give it to them at the Ferry Building. We would receive it there, bring it over and give it to them on the train.

Morris: That's a fair amount of time with one customer and one suitcase, isn't it?

Ferguson: Yes. We would give them a [receipt] slip and take charge of the bags and keep it on the--.

Morris: Put them on a dolly or something like that?

Ferguson: Yes. We worked together and pooled our tips. It made it very convenient. I sewed pockets on the inside of my uniform coat so I could carry my books and notes. Going over on the ferry was an eighteen-minute ride where you don't have to do anything but sit down. So I would study. Every chance I got I would study.

Morris: Eighteen minutes. You can get something useful done in eighteen minutes?

Ferguson: Oh, yes.

Morris: Good for you. What were the other guys doing? Playing cards?

Ferguson: No, not playing cards. Maybe just sitting around talking. I would go find a corner where I could be by myself on the ferry boat. Anyhow, that was a convenient job for going to college. I did that until my graduate school days.

#### Student Life: Meeting Charlotte Welch in 1943: Raising Children

Morris: There were a couple of fraternities that black students had organized by then. Did you sign up with either of them?





Ferguson: National black fraternities and sororities were organized around 1905-1910, but I do not know when Cal chapters were formed.<sup>2</sup> Anyhow, I did not participate in any of their social activities. All my time, essentially through undergraduate school days, was taken up working morning and night and going to school during the day. I didn't do much else. Occasionally on Saturday I might go to a football game, a Cal football game or something like that. But I missed out on parties at the university that black students might be arranging and so forth. Actually, I didn't join a fraternity until after I got my Ph.D. and was going to take a job at a black college. My wife, who had gone to a black college and knew the social life there, urged me to join because that is part of their activities.

Morris: It was a social fraternity rather than a professional one?

Ferguson: Right, Alpha Phi Alpha. I guess that sums up most of my activities. Of course, as I said, I was working as a redcap and supporting myself through college, and so I concentrated on my studies.

Morris: But did you live at home?

Ferguson: I lived at home, finishing off the period when I was with my grandparents. Then eventually I moved in with my mother and father who lived a block and a half away.

Morris: That's nice. Did your wife also grow up in Oakland?

Ferguson: No. She grew up in Arkansas. She and her brother and sister all graduated from the same college.

Morris: She went to college in the South?

Ferguson: Yes. She went to Wiley College in Texas.

Morris: What got her interested in college?

Ferguson: Her parents just encouraged all three children to go to college and fortunately they were able to pay the expenses of all three. After graduation, my wife came out here during the war years, when I met her.

Morris: Was she working at Cal?

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<sup>2</sup>See interview in this series with Ida Louise Jackson on the founding of Alpha Kappa Alpha and sorority chapters at Berkeley in the 1930s.



Ferguson: No. She lived at that time with her brother and sister-in-law about a block away from my house. We met through them.

She is largely responsible for the fact that our three children are professionals and went to college and so forth, because I was away so much. She had much more influence in seeing that they went to college. Our older son is a professor of engineering in the Cal State University system at Cal Poly, Pomona. He got his Ph.D. in engineering at UCLA. Our younger son is a musician. He went to UCLA. He composes, records and performs.

Morris: Classic or more contemporary?

Ferguson: Both, but right now he is playing piano in a trendy restaurant in Venice [California]. It depends on the customers. You know, certain customers like classical music and he will play mostly that certain evenings. Other evenings, he plays contemporary music. My daughter got her A.B. and J.D. here at Berkeley. Right now, she is a research attorney for the San Mateo Superior Court. She was very active here in student activities, particularly among the black student associations. In law school, she was an officer in the National Black Law Student Association. She has a little plaque for her services.

Morris: Of the more activist kind or the more traditional?

Ferguson: Both, such as protesting U.C. investments in South Africa and in association programs to encourage each other and others to go to school, stay in school, participate in--.

Morris: Work within the system?

Ferguson: Yes. She was also the general coordinator of the Berkeley Jazz Festival that they've had here for a number of years; eighty-five and eighty-six.

Morris: That's been going on for quite a while.

Ferguson: Yes. We enjoyed coming up to listen to the performances that were given. It was a tremendous job on her part. She is not married but our two sons are. Their children are headed for college. They are not old enough yet but they know that they are going.

Our older son has twins, Jelani and Layla, who are sixteen. They are thinking about which college--. In fact they are doing--. What do you call it?



Morris: Are they doing what they call advanced placement, taking college-level courses while they're high school students?

Ferguson: Yes, right. They attend magnet schools. Jelani, one for science, math, and aerospace, and Layla attends an arts magnet school.

Morris: That is quite a decision for twins. Whether to go to the same place or go to different schools.

Ferguson: Yes. This is the first time they have gone to different schools. Otherwise they have always been in virtually the same class. They are a boy and a girl.

Our younger son, Steve, also has a son and a daughter. The son, Miguel, is in middle school, and is an outstanding musician. This past year he received perfect report cards; that is, all A's on academics and all "excellents" on behavioral characteristics. His sister, Francesca, is in first grade and is just starting music lessons.

### Learning to Study

Morris: What was it like when you were a freshman here? Had you been kind of keeping an eye on Cal as where you would like to go to school?

Ferguson: I only thought in terms of Cal. It was almost as if I didn't know there were other colleges. There wasn't any particular problem. I just registered right away. Of course, since my parents and none of my adult relatives had been to college, I had to search and find out all the routine and everything myself.

Morris: Were there counselors in high school to help you?

Ferguson: Yes, but since I had been out of high school for two years working, I was out of touch with them. But I mean it was simple. You just came up here and registered. I had no particular problems, probably because I was in a field that I really liked.

One thing I did discover, I really didn't know how to study. All through school I had been getting good grades without any unusual pressure. So I didn't know how to study. If I wanted to prepare for an exam, I would just go out and read





the book and so forth in the car. But during my first year or second year, I don't recall which, I joined a study group here of three or four fellows. We studied chemistry and physics together. That was very good for me because one of the members, particularly, was very organized.

We did quite well. We all enjoyed the association. Each of us was pleased with the result. All of us did fairly well in school. In fact, this one person I mentioned who was very organized, Pat Fuller, was Phi Beta Kappa at Cal. His family and my family are very close after all this time, some fifty-five years ago.

Morris: Had you known him in high school? Is he a local fellow?

Ferguson: I knew him in high school, but we were a year apart. It's just a matter of having known him. We didn't play together. We weren't particularly close friends or anything at school. It was just that we had known each other and somehow we got together.

Morris: Who else was in the study group?

Ferguson: Oh, a fellow named Gus Dorough. He was a chem major. He went to work for the Atomic Energy Commission after he had completed his Ph.D. And Walter Rhoades, who was a chemistry major too. He worked in industry. I lost track of them, although Pat is in contact with them and is still trying to get us all together.

Morris: I should think so.

Ferguson: A fourth was Bill Dorsey. I don't know where he is either, but Pat knows.

Morris: He was kind of the organizer of the group as well as the study organizer?

Ferguson: I suppose so. He and his wife came to my fortieth wedding anniversary party, and later came to my retirement symposium. We've been to his house several times.

Morris: That's neat. What did he do professionally?

Ferguson: He was a criminology major. In fact, Pat and a friend of his started Oakland's crime laboratory down at the city hall when it was on Washington Street. There was nothing there. They were up in the attic, just two of them. They started the crime lab and of course it went on to become a full-fledged laboratory. Then Pat went into security type of work. He worked for the





military. I'm not sure whether it was the navy but in security work. Then he worked for the Food and Drug Administration, always at security types of activities. He graduated and went into the service. That's right; he went to law school after criminology. After a B.S. here, he went to law school in San Francisco.

Morris: Does that mean he was taking the classes of, wasn't it August Vollmer, who was the scientific criminology guy here at Cal who was also the Berkeley police chief? Or was that earlier?

Ferguson: Well, possibly. I just don't remember. I remember there was a person in biochemistry who was a very strong consultant in that field. I should remember that name because he was on my dissertation committee. Let's see? Well, I really don't remember his name.

So Pat got a law degree and went into that type of work. In fact, before he graduated, he did some handwriting detection for the state, I remember.

Morris: Really? That's neat.

Ferguson: So it was fortunate that I got into that group to help me.

I recall now there were a couple of times when I got into a tight spot in the lab. One time something went wrong with an experiment where I got a strange-looking yellow compound and things got a little bit out of hand. So I had this bucket full of stuff and I should have thrown it slowly down the commode. But what I did was take it out and throw it in the gutter. That yellow stuff ran all the way down the street across the campus. Did I catch it from the professors!

Morris: Oh, my. What else are you going to do with a bunch of stuff you don't want!

Ferguson: Another time I was working--I was an undergraduate this time--and I had just learned how to make a material that, as long as it is wet it is safe, but when dry, it easily explodes. You just have to touch it and it goes off. It is not powerful but it does explode and makes a lot of noise. So I made a big batch of that in the lab and set it up on the shelf while we went down to have lunch. While I was away, some of it dried and something set it off. It was right next to the professor, Professor Porter at that time, to his office. I was told he came dashing in there, wanted to know what had caused it and so forth. I disclaimed any knowledge of that!



Honors Student: Advances in Scientific Research

Morris: It says you were an honors student. Did that mean that you were working on special projects?

Ferguson: No, it just meant gradewise, I had closer to an A than a B average. That's right. After you got into your junior year, they had courses which were labelled H, for honors courses. I took those courses--the honors sections rather than the regular sections. In your senior year you worked on the research projects so I worked on a research project under Professor [Erman D.] Eastman.

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Ferguson: I was going to mention that as a result of the grades, I guess, during junior or senior year, I was invited to the rushing luncheon of Alpha Chi Sigma which was, or is (I'm not sure that it is still in operation), a chemistry fraternity, a national chemistry organization--not just fraternity because I think they let women in.

So I was invited to the luncheon just on the basis of grades, but when I got there and they saw that I was African American, the invitation to join wasn't followed through. My name was just dropped from it. I didn't think too much of it at the time until later in the year when I found out all the other fellows had been included.

Morris: Did you ask any of your professors about it?

Ferguson: No, I didn't challenge it. I accepted it and went about my own interests.

Morris: How about the faculty in the chemistry department? Did any of them cause you any problems or make you feel left out?

Ferguson: No. I got along well with the chemistry faculty. I was impressed with the chemistry faculty. They were very friendly.

You raised the question of how was it going to school in the forties. I think it was exciting, the thirties and the forties, because I feel that the research that was done in those two decades by faculty and graduate students and so forth here led to more Nobel Prizes than any other two decades. Quite a few of my professors became Nobel laureates: [Melvin] Calvin, Willard Libby, William F. Giaque, and [Glenn T.] Seaborg in chemistry, and E. M. McMillan in physics. There were quite a



chemistry, and E. M. McMillan in physics. There were quite a few of them rewarded for the work that was done during that period and during the war years.

I didn't work on the atomic energy project. I worked on another national defense project with Calvin. Gilman Hall at that time, the upper floors, were closed off to others who were not in the atomic energy research group.

Morris: It was classified as a secret area?

Ferguson: Yes. But the students, of course, all the graduate students who were working on the project, and I and a couple of others who weren't on the project, all came to graduate school together so that we had a little idea of what they were working on.

Morris: Were you aware that this was really new stuff that was being done on the campus?

Ferguson: Oh, yes. The basic studies connected with that we would learn right in school. In other classes, many of the faculty members were using textbooks that they had written. In our instruction we were right on the forefront of what was known.

Morris: So that some of their research work was coming through into the coursework?

Ferguson: Yes. Some of the basic ideas would come up, be a part of the instruction.



## III EARNING A DOCTORATE IN CHEMISTRY

George Washington Carver's Advice

Morris: When did you decide that you wanted to keep going--?

Ferguson: In chemistry?

Morris: Yes. And do graduate work and get a Ph.D.?

Ferguson: Well, I guess I always thought in terms of wanting to teach and therefore I needed a Ph.D. I just sort of expected that I would do that. I was lucky to be able to do it here in Berkeley because, at that time, the general policy was not to accept their own undergraduate students for graduate work. That was the policy not only here but most strong graduate departments did that just so that students would get a broader view of the field rather than go all the way through one department or one school for undergraduate and graduate work.

In fact, what I did do was, right when I was graduating, I wrote George Washington Carver, the peanut man.

Morris: Himself?

Ferguson: Yes. I wrote him and asked him if I could come to study with him because he was getting a lot of things from peanuts; his whole work was discovering things you could make from peanuts. I had learned about that, so in fooling around in the laboratory I said to myself let me see what I can get from something else. I chose rice. I did some work with rice and I got a gas from it which would burn.

Morris: Like for driving an engine?

Ferguson: Gas like natural gas. I collected that and I sent it to a gas company here and had it analyzed to find out the heating value. They said the heating value was about that which would be needed





to make more gas, not extra, so I wouldn't profit anything from it.

Morris: You weren't adding to the supply of energy.

Ferguson: No. Then I got some other little oils and things from the rice. Nothing exciting, and I didn't really know which direction to go to try to get something from it. So that's when I wrote Carver. I thought if he could get so many useful things from peanuts, I would like to study with him.

But he wisely said, "No, you should go to graduate school first." That's when I inquired about going to graduate school here. Dean [Gilbert N.] Lewis thought it over and then finally accepted me. So I was very pleased about that.

#### Hazards of Research

Morris: How did you come to work with Melvin Calvin? He's not that much older than you. He'd just joined the faculty in 1937.

Ferguson: No, he was one of the younger faculty members. In fact, when I started working on the project, I think I was making more money than he was making as a professor. Project assistants got a salary sort of based on a government level or something like that. Actually, when I graduated in 1940, I was still redcapping.

Then, a few months later, Seaborg said, "Lloyd, what are you doing when you go home? How are you supporting yourself?" I told him I was redcapping. He said, "Why don't you work here in the department? Do some professional work." I said, "Great." So he got me a job working in the [Donner] radiation laboratory.

Morris: Up on the hill?

Ferguson: No. At that time it was right there on campus. It was right behind where the freshman lab used to be. I don't think the building is there now. And I worked under Martin Kaymen. So I quit redcapping, of course. My responsibility was to put cans of carbon tetrachloride around the cyclotron which would absorb the radiation that was emitted. Then, periodically, I would take certain cans away and treat the contents chemically to isolate the radioactive sulfur that is produced from the carbon tetrachloride. I worked that up and prepared barium sulfate to



send that around the country to laboratories where they wanted radioactive sulfur for a tracer in chemical processes or biological processes. That was my job.

Morris: Did anybody at that point have any concerns about--?

Ferguson: Health hazards?

Morris: Yes.

Ferguson: We had concerns but not the knowledge regarding how toxic carbon tet really is. Of course, use of carbon tet is now restricted. I remember I was working with a great big glass vessel that had a little tripod under it. It fell down and all this carbon tet spilled on the floor. My lab was about a third of the size of this room. I was just in it by myself. I had tears coming out of my eyes from the fumes, trying to mop up all that carbon tet.

Morris: But the floor got nice and clean.

Ferguson: Yes. [chuckles]

#### Working with Melvin Calvin: Cooperative Research in the National Interest

Ferguson: After about three or four months on that job, [Wendell] Latimer, dean at that time, and Calvin asked if I would be interested in working on a new national defense project that Calvin was directing. Since it was organic and I liked organic chemistry, I switched over to that. So instead of becoming a nuclear chemist, I became an organic chemist. I worked on that for about three years with Calvin.<sup>3</sup>

Morris: Was that the photosynthesis project I saw reference to in some of your biographical material?

Ferguson: No, Calvin received the Nobel Prize primarily for his work on tracing the chemical pathway that carbon dioxide undergoes in plants to be converted into sugars. I was not involved in that project. Our wartime objective was to find a reversible source of oxygen for high-altitude aviation, submarines, and

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<sup>3</sup> Dr. Ferguson and Dr. Calvin published several articles together in the Journal of the American Chemical Society between 1946 and 1950. See publication list in appendix.



battleships. Up to that time, battleships, when going into a skirmish, would throw their tanks of oxygen overboard because if the top of the tank were knocked off by military action, then the tank itself would be a missile and could go through several walls. So they would get rid of them.

Then after the skirmish, when they might need some oxygen for welding and so forth, they had none. During World War I they tried sodium peroxide which they could heat to generate oxygen. But you could only do that once. After you heated it and got the oxygen from it, you had this dead weight of chemical left behind with no additional oxygen available. The objective was to find something that you could heat to get oxygen and then some way it would restore itself and you could heat it some more and get more oxygen.

So that was what we were trying to develop. In simple terms, we sought a substance which absorbs oxygen from the air and releases it when needed, much like a chemical in the blood absorbs oxygen from the air and releases it to the lungs. After doing so, it absorbs more oxygen and the process repeats itself over and over. There were several centers where work was going on on that same project: one at UCLA, one at MIT, Iowa State, and here at Berkeley under Calvin.

Actually, it turned out that the material that we produced was the one that was finally developed and put into use. Professor Theodore A. Geissman was in charge of the UCLA group. He was a professor of organic chemistry. One little session that we had was interesting. Geissman came up to talk over with Calvin and our group how things were going. I remember Calvin was very enthusiastic. We had worked out on paper the way that we were going to try to make a key chemical that was needed. I guess I had thought of it and talked it over with Calvin. Actually, Calvin was a physical chemist, not an organic chemist, whereas Geissman was a basic organic chemist.

So Calvin said, "Go ahead, Lloyd, tell him your plan." I wrote out the equations and everything on paper, whichever way we had planned. Geissman looked at it and said, "I don't know. I don't think it will work." On paper, it looked good. Sure enough, we tried and tried and tried. That route never did work. However, as I frequently told my students, even though Geissman was correct on that point, it was Calvin who later got a Nobel Prize.

Morris: He was the one who put together the combination that worked.





Ferguson: Yes, right. So we used another route to get that compound. As I say, it was the one that was eventually adopted for producing the chemical. Then industry took it over; the Monsanto Chemical Company. They prepared the compound and it was actually used on submarines.

Morris: For industrial oxygen, not for breathing three miles below the ocean.

Ferguson: Yes. It could be used on an airplane or battleship or submarine. So at that time, the project was coming to a close.

Morris: You solved the problem.

Ferguson: Yes. So what I did was take a teaching job that came up. I do not know to what extent it continued to be used by the navy and others.

Morris: It sounds as if the same research chore was given to four different institutions. Why is that done?

Ferguson: Different approaches and different aspects of it. One problem was how to produce it on a large scale. We did the basic research to develop the process. Then another center at New York was going to, again, mass-produce it industrially.

Professor Geissman went to the New York lab to oversee this large-scale production. Something went wrong in the industrial lab and he rushed in to turn off some of the equipment and he inhaled quite a bit of this material and that eventually led to his death.

Morris: It damaged his breathing equipment?

Ferguson: Yes. Right.

Morris: Does that produce controversy or conflict, to have four different organizations working on the same project?

Ferguson: No. We collaborated. In addition to just making the compound, we had to study how to make it so it would be in a physical form that would make it work. We did some of that. But particularly Iowa State did a lot of that in trying to see how to grow the crystals so that they could be used. So you have different centers studying different parts of the problem. Probably the UCLA center and our center were concerned quite a bit about the same active phase of it, that is, producing the basic organic materials that could be used to synthesize the final compound. You see, it is something that you have to heat. You are getting





oxygen and oxygen might turn around and burn the material up, so you have to find a substance that would withstand this exposure to oxygen and also you wanted it to be reversible so that you could carry out this process some thousands of times.

You see, it slowly deteriorates. You want to find something that would last as long as possible.

### A Racial Incident

Ferguson: In connection with that oxygen project, one other thing comes to mind, a racial incident. Finally, when we found this key compound that we wanted to use, then we decided to produce it in a larger quantity. What we planned was to take a bomb casing, the shell of a very big bomb--What we wanted to do was build a piece of equipment so we could produce this compound on a large scale.

So I had contacted some company here in Emeryville that designed and manufactured ironware. Over the phone I told them what we wanted and we sent them a diagram. So they were going to build this big reactor from this bomb casing. Finally, when it came time for me to go look at it to see if it would be suitable, I went down to the factory. In the office, there was a secretary. I told her who I was so she called the manager in. There were just the two of us in the office, and he came rushing in.

He glanced my way and went over to her and said, "I thought you said Dr. Ferguson was in here and was waiting for me?" She said, "It is Dr. Ferguson." It just didn't occur to him all that time that I was a black fellow. I was amused at that, anyhow.

Morris: Once he got over being surprised, was he okay to deal with?

Ferguson: Oh, yes, he was okay to work with after he recovered from the surprise. That happens.



## IV ACADEMIC EXPERIENCES FROM NORTH CAROLINA TO EAST AFRICA

A&T College, 1944

Morris: What was it like to go from this pure research into the classroom, to go into teaching?

Ferguson: I guess I always liked teaching.

Morris: Did you apply for a teaching job at a California college?

Ferguson: Not really. I guess I should mention that when I was an undergraduate, my counselor, Professor Stewart, had told me that it was very unlikely that I would get a professional job in industry when I graduated because of my race. That was one of the reasons I prepared for teaching. I took some engineering classes and I took some psychology classes in preparation for teaching. That was before I started graduate school. Of course, then I went into graduate school so I didn't have to look for a job at that time.

Morris: Did you have to worry about being drafted? Were you exempt?

Ferguson: By working on Calvin's project, I was exempted from military service because I was making a contribution to our national defense. I was lucky to be able to do my dissertation work under Professor G. E. K. Branch simultaneously while working with Calvin on the project. Thus, I had two different types of research going on. I learned a lot from both of them because they were very different in their approaches to research problems. Branch was very easygoing. He would never come to me to see how I was getting along. I would always go to him and we would just talk, very easygoing.

Whereas Calvin was the eager-beaver, inspirational type. He would come, place his head over my shoulder and ask, "How are things going along?" I guess I got more out of him as far as



instantly and aggressively attacking research problems and so forth.

I recall one night I was working late in the lab and Calvin came by. I wrote out an equation that conceivably could produce a new class of compounds. Calvin said it looked good, and asked, "What will we call it, Fergusonobenzene?" I was very excited, here I was only a grad student, about to discover this new type of compound. I waited until the next morning to try the experiment. I prepared the separate solutions needed and started the reaction process. I was stooped down to watch the temperature closely as the reaction proceeded, when it blew up, showering chemicals above my head. After washing up, I went to the library to see if I could find information on what is formed when the salt I had used is dissolved in sulfuric acid. I learned that an orange explosive solution is produced, which is just how my solution appeared. So, then, I had this large volume of explosive sulfuric acid to get rid of. When I told my lab mate about this, he vanished. Fortunately, I managed to decompose it safely, but with a loud bang.

Later, when I was about to get my Ph.D. degree, I noticed that none of the recruiters set up interviews with me. Then, I realized that it was going to be a little difficult in getting a job, as Professor Stewart had said. It just so happened at that time, an announcement of a teaching position came into the department at a black school in North Carolina, A&T college. So the secretary gave it to me and I investigated and found out it seemed to be a good institution at which to work. I applied for the job and got appointed assistant professor there in Greensboro.

Morris: A&T is Agricultural and Technical?

Ferguson: Agricultural and Technical, yes. It is now referred to as A&T University.

Morris: You and I might know that phrase but--.

Ferguson: Right. Agricultural and Technical College. So my wife and I decided I should take that job. Then after a year, I accepted a position at Howard University which was a larger university.

Morris: It's interesting that North Carolina A&T would be recruiting all the way on the West Coast.

Ferguson: Being a black college, they were looking for African Americans wherever. I guess that job announcement went completely around



the country looking for a teacher. This was 1944, a war year, so there weren't many applicants that they were going to find.

Morris: Things have changed, haven't they?

Ferguson: Yes.

### Marriage: Draft Status

Morris: Had you married by then, during graduate school?

Ferguson: Right after; we got married in 1944.

Morris: How did you manage to find time during all your research work to go courting?

Ferguson: Well, as I say, she lived a block from me.

Morris: Had your families become friends?

Ferguson: No. We met through a lady who worked with her sister-in-law. Since Charlotte lived a block away, it was easy to visit. We went on from there.

In 1944, after I took that job at A&T. I almost got drafted; I didn't have a deferment then. I went in for a physical exam. The people at the base, when they found out I had a Ph.D.--.

Morris: Was this in North Carolina?

Ferguson: Yes. Somehow, I think I was under the impression that being a teacher of chemistry would give me the same draft status.

Morris: More deferment, yes.

Ferguson: I think things got worse and I no longer had that status. They were about to draft me.

Morris: Selective service was also looking for people with your kind of education.

Ferguson: No, not necessarily. They sort of agreed to ignore the fact that I had a Ph.D. I would have been just placed in regular basic training. I don't remember now what type of unit, but they certainly were ignoring my background. But the people on







the base were very impressed. Once I looked over someone's shoulder. They were trying to extract a square root or something. I told them how to do it. Further along the line, there was something they were trying to do mathematically and I would help them. But that had no affect on my classification.

This was early in 1945. It looked like Japan was getting ready to drop out. That made it easier to keep my classification.

Morris: Your timing was good. What did you think when those atomic bombs were dropped on Japan? Did you recognize that as the outcome of the research that was going on at Berkeley?

Ferguson: Yes. Of course, I didn't know all the engineering details that had to be worked out before it could be successful. But I had an understanding of the basic science involved just from listening to lunchtime conversations. There is a big difference between understanding basic science and getting a mechanical setup to work.

#### Howard University. 1945-1965

Ferguson: Anyway, I was about to move on from A&T, change teaching positions. I also considered a job at Tuskegee. In fact, I had already told them I would go. Tuskegee was where Carver was. I'm not sure whether he was still living at that time, but I thought I would go there. But then I took the opening when the job at Howard came in.

Morris: Did Howard make you a better offer?

Ferguson: Not financially, but opportunities were better. In fact, even financially, they gave me a retroactive raise after I got there. Opportunities were better for professional growth there at Howard than at Tuskegee.

Morris: Why is that?

Ferguson: Well, Howard had a better financial base. Howard at that time got 75 percent of its funds from the federal government. Although it was an independent institution, it was still supported financially by the federal government. Whereas Tuskegee wasn't.



Morris: Even though Tuskegee had a whole bunch of wartime military training programs?

Ferguson: Yes. You mean, the Tuskegee Airmen?

Morris: Yes.

Ferguson: That didn't net a large amount of funds for the academic program at Tuskegee. So I went to Howard. It was a bigger department. The chemistry department as stronger, and I was glad to get the chance to supervise some students in graduate level research.

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Morris: When did they talk about the possibility of setting up a graduate program?

Ferguson: Not at that time, that is with respect to the Ph.D. program. They already offered a masters' degree. The only thing that was mentioned was possibly becoming head some day. The dean wanted that. They had a white fellow who was chairman of the department. He was very good for the department. In fact, when I did become head, that was one of the first things the dean sent me, a note: something about, "Finally" or "Congratulations" or something like that.

Morris: "This is what we had hoped for."

Ferguson: Yes.

Morris: That's nice. How big was the department?

Ferguson: The school had something like 10,000 students. In the department, we probably had ten faculty members or so. Something like that. They all did research and published books and journal articles. They had a stronger graduate school and attracted some of the cream of the available black students. Not only in chemistry but in social sciences and in other fields, they had many of the top of black professional people, like, at one time, the Nobel Prize winner Ralph Bunche. Many black scholars first gained national prominence at Howard, such as Charles Houston, Thurgood Marshall, William Hastie, Ernest Just, Percy Julian, and others. Some who were still there when I went were E. Franklin Frazier, John Hope Franklin, and Alain Locke. I was pleased to hear their different views. Also--who was the blood physician, I cannot think of his name. You know, the fellow who developed the blood bank. Oh, yes, Charles Drew. Anyhow, he was there.



Morris: What did it feel like at A&T and Howard? This would have been the first time you were in a primarily African-American community.

Ferguson: My wife had prepared me for it. The only thing that shocked me was that at A&T during that year, the students had a strike against the food that they were getting in the cafeteria. A strike by students! I just couldn't understand it. I went to work that day and they were striking. It was soon settled.

Then when I went to Howard, I enjoyed it even more because the students had a little bit more mature background. We had more students and we also had quite a few students who could intermingle with the physics department. The physics department was very strong. And the medical school was very strong.

Morris: Was this a period when the boundaries between physics and chemistry were being tested or there was more cross-disciplinary stuff going on?

Ferguson: I guess so. Also, biology and chemistry. They had a good zoology department.

Morris: That helped strengthen the chemistry department?

Ferguson: Yes. They have to know the physics and math, particularly physics. That's right--David Blackwell was there in mathematics. I don't know if you know him here at Cal. He probably is retired now. He was chairman of the statistics department here for some years. He was an outstanding statistician. I think Time magazine has placed him in the top five in the country. He was there. We played a lot of chess together. And Lawrence Robinson was there in physics, who became a professor and sometime dean at UCLA in engineering. Herman Branson in physics, an outstanding physicist who became a university president.

So there were persons in these other related departments who were strong in their fields.

#### Sabbaticals in Copenhagen, Zurich, and Kenya

Morris: So there were good people to be associated with professionally?

Ferguson: Yes, right. You could always go and consult with them on some of the problems in their field to help you in your field and so forth. Also, Howard had the usual sabbatical system, so we took





advantage of that. My first sabbatical was in Copenhagen and the second sabbatical in Zürich. Actually, the major reason that the first one was there in Copenhagen was that when it came time for a sabbatical, I was thinking about coming back here to Berkeley. Actually, what I wanted to do, one of my Ph.D. classmates, John Goffman, had gone on and gotten an M.D. and he started working here. He was concerned with atomic energy and biological sciences, having an M.D. and a Ph.D. He got his Ph.D. in nuclear science. Anyway, I wanted to learn some of the techniques of using radioactive tracers for studying biological processes. Not with Goffman but in the Lawrence Radiation Laboratory.

Morris: The impact of the radioactive materials on the human body?

Ferguson: Not the impact, but ways to use radioactive substances to follow chemical processes in living systems.

Anyhow, I thought I would like to come back to Berkeley and work in the radiation department. Professor Calvin's wife, Genevieve, who came with him on a trip to Washington--I guess I had gotten Calvin to give a talk at Howard, and his wife came. His wife and I think one or two children came that time, and my wife hosted them in our home. Gen Calvin said, "Don't come back to Berkeley. Go someplace else."

Morris: Really.

Ferguson: After all, I got a B.S. and Ph.D. there. Why keep on--. "Go some place else." She thought going to one of the Scandinavian labs would be good. She herself was of Scandinavian descent. I looked it up and found out that the Carlsberg Laboratory in Copenhagen was well known for its biochemical work. I had never taken biology. They were well known for a technique that they had developed for studying processes in cells, one cell at a time. I applied for a Guggenheim fellowship and was lucky to get one. This happened to be just after my first book was published.<sup>4</sup> It probably had an effect on being able to get the Guggenheim award.

One of the surprises that occurred there was that Guggenheim decides whether or not they are going to give you a fellowship. Then they ask you how much money you need. You don't apply for a certain amount; you just apply for a fellowship.

Morris: How do you know how much you need until you've decided where you are going?

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<sup>4</sup>Electron Structures of Organic Molecules, New Jersey: Prentice Hall, 1952.





Ferguson: Right, what your expenses are going to be. But this book had just come out and I had just received the first royalty for two months' publication or something like that, so I extrapolated that into what I was going to make over a year's period. That had a big effect on how much I asked for. So they gave me what I asked for, which was less than the average award. Of course, I didn't realize that those book sales are large when the book first comes out, because a lot of people are buying it to examine it. But the sales didn't continue at that same pace. Anyhow, we managed. We didn't lose money for that year because I had my sabbatical from Howard.

Morris: But once you get your sabbatical, do you then go scouting for somebody who would like to have you come for a year and work for them?

Ferguson: Well, I think you do it all at the same time. You sort of have an idea of what you want to do. You contact different places to go at the time you apply for the sabbatical. So we went to Carlsberg and we enjoyed it very much. The Danes are wonderful people. Actually, we made friends with several Danish families; just last month, we went on a cruise to the Scandinavian capitals, and after thirty-eight years we looked up one of the families who we kept in contact with through Christmas cards. We visited them and visited where we had lived. My wife and I enjoyed it very much.

Then on the second sabbatical, we went to Zürich, where I worked with Professor V. Prelog, who became a Nobel Laureate. One of the aspects of sabbaticals I would point out are the benefits to the family. All of us got to travel, including my children. My older son, when we went to Denmark was nine. We put him right into a Danish school. Within two or three months, he was speaking Danish enough to understand lessons and playmates. He served as the family interpreter because we didn't know the language at that time. We later learned a few of their expressions.

On the second sabbatical, that son was sixteen and he had just graduated from high school. He had been admitted to Cal but he decided he wanted to go with us. He became attached to the baby because our daughter was born just a few months before that. That's Lloyd, the electrical engineer.

Morris: So he took a year off between high school and college?

Ferguson: Yes. So he came. In Zürich they speak German. He went to the high school there, which is sort of equivalent to our junior college. He became fluent in German. He had already had a year



of German in high school. It made it easier for passing Ph.D. exams in German, of course.

Morris: I should say. He'd already had the language.

Ferguson: Yes. Then on our third sabbatical, which I got when I was at Cal State L.A., we went to Kenya. My mother-in-law and our daughter went with us. She attended a private school where a lot of the students go on to college. She learned some Swahili. They put her in a Swahili class where there were some Kenyan students all of whom more or less speak three languages. They speak their tribal language; they speak Swahili which is the national language and they speak English, those who go on in school.

Morris: Was this a mixed race school?

Ferguson: Yes. Very mixed.

Morris: Was this before or after the political changes. Or during?

Ferguson: This was after Kenya was free from the British empire. This was in 1971. Our travels on these sabbaticals, of course, helped all of our children become aware of different cultures. Each has lived a year or more in a different culture and has traveled extensively in Europe, Africa, and Asia.

Morris: It's quite an experience.

Ferguson: It makes them like to travel. That is something I couldn't have afforded if I were just working in industry. These sabbaticals, I think, are a big plus for teaching.

#### Ford Foundation Sponsors Review of East African Universities

Morris: There was a note in one of your articles that you had a Ford Foundation grant at the time of your Kenya sabbatical?

Ferguson: Yes. In that connection, what I did was write to the Ford Foundation. I told them I would like to go to East Africa. I thought I had something to offer in teaching and so forth. At the same time, I would be able to learn something about East African culture. So the Ford Foundation had an office in Nairobi concerned with education and agriculture, and other subjects. They supported agriculture in some of East Africa;



they supported education; they supported some engineering and so forth.

Luckily, it just so happened that also the university in Nairobi was looking for an organic chemistry teacher. So the Ford Foundation and the University of Nairobi got together and the Ford Foundation awarded me funds. This was unusual because usually--I didn't know it at the time--they don't support individuals; they support programs. When I got over there, they asked me to travel to several universities because they were trying to decide to what extent they would support science and engineering in some of these institutions. Accordingly I visited Haile Selassie University in Ethiopia, the University of Zambia, the University of Dar-es Salaam in Tanzania, and Makerere University in Uganda.

Morris: Kind of as a consultant?

Ferguson: Not as a consultant to the universities but just to explore and find out what they were doing in engineering and science. Actually, an engineer went along and he was looking at their engineering programs to provide information to the Ford Foundation.

Morris: Were these mostly relatively young universities?

Ferguson: Not necessarily young, but they certainly were striving financially. They were weak financially. Haile Selassie University had been in existence for decades.

Morris: Mostly for black students from their own country?

Ferguson: Well, for the Ethiopians. The university in Uganda was quite well established, particularly providing education to East Africans at that time. This was when--. Let's see. Who was it, Big Daddy--.

Morris: Idi Amin?

Ferguson: Idi Amin was in power. Actually, he wasn't doing anything helpful for the university at the time. This was in 1971; some of our neighbors in Nairobi told us not to go because things were kind of dangerous.

Morris: Heating up in Uganda.

Ferguson: Yes. But we went. Actually, we went over there several times. The first time we went over there, it was for the Ford Foundation; there was no particular trouble or anything like that. But the third time we went over during the summer of





1972. That's when Steve was with us and that was when we were warned not to go because, one thing, they didn't like young men wearing beards [laughter]. Steve had a beard and he wouldn't cut it off. Finally they told us that as long as we stayed in the tourist sections of town it would be all right.

Morris: Did you have a guide or a security person?

Ferguson: No, we had a car and would just drive ourselves. We went to the consulate in Kenya to get a visa to travel. We enjoyed it very much. Kenya is a beautiful city. For quite a few years when I came back to the U.S., I would go around talking about East Africa with pictures. Most people, when you say Africa, think of jungle and so forth. But some of the cities, some of the beach motels, are very beautiful. We enjoyed it. The food was great.

In Nairobi, health conditions for us were very good. The university physician was our family physician. We didn't have to worry about the water. They don't have to boil it like in some other countries. Their water was good. At that time, the health conditions there in Nairobi were very good. My daughter just loved the freedom that she had: going to school, traveling around in the neighborhood.

Morris: Different from how she felt back in the States?

Ferguson: Different in the sense of the freedom. She could go visit a couple of her girlfriends and stay overnight or so forth. When one of her girlfriends would go on a safari, she could go with them and things like that. None of the time restrictions like she would have here in school. In fact, their school schedule was three months in school and a month off, then three months in school and a month off. You could travel a lot.

### Encouraging Black African Professors and Students

Morris: How did the university programs that you went to look at compare with the ones at Howard and Cal State L.A.?

Ferguson: Well, they were not as strong as at Howard, although the university in Uganda had a strong graduate program. This school had the best equipment. That's right; the university there in Nairobi, one of the campuses had some physical equipment that was being provided by an international organization that allowed them to do some really advanced research in biomedicine. One





thing at the University of Nairobi, virtually all of the students were Kenyans, which meant they were either Indian or black Kenyans. There were a couple of white Kenyan students. Particularly the black students were pleased to see a black professor come over. The professors there were white; after the British system, a department would have one professor and everybody else would be assistant professors or you might be-- . What do they call it?

Morris: A lecturer?

Ferguson: Well, lecturers in the lower ranks. There is one other title that they give, sort of like a visiting professor. I forgot what they call that. But anyhow, my coming in as a professor, this sort of gave them some inspiration. They were happy.

In fact, when I left, I wrote a strong letter to the administration and copied it to the professor. I didn't think that he was right for the department because his opinion was that the black students just couldn't learn and would not be able to learn enough to go to graduate school and become professionals. I thought that was the wrong attitude. Some of them showed promise of going on in their professions. By coincidence, he didn't stay there much longer. I don't remember where he went.

Morris: Do you think your letter made the difference?

Ferguson: I think it had an effect. We met a couple of African professors in different departments. Actually now we have met the professor in that department. He is a black African. He has been over to the United States and spent some time here. One of the other persons in that department who was a lecturer at that time has come over and spent some months with us at Cal State L.A.

Morris: Somebody that you had worked with--?

Ferguson: Over there, right. We maintained contact with a couple of the faculty members there.

Morris: When you were doing your graduate work here at UC Berkeley, were there any students from East Africa on campus, living at International House or anything like that?

Ferguson: Not that I know of. Although, at the I House at Cal, I was told there were a couple of Africans living there. But I hadn't met any of them. I kept my nose to the ground pretty much both in undergraduate and graduate school days. In grad school days, I



was working on the two lines of research: the doctoral research and the project research. And in undergraduate school, just redcapping and studying and so on. I didn't get involved in any outside activities. As I said, I didn't join a fraternity until I had my doctorate and was preparing to take a job back East, where they were more active.

Morris: Did younger fellows come to you for advice or suggestions about going to Cal or anything like that? I am interested in the mentoring relationship.

Ferguson: I don't know. I know that there were a couple of persons who later--I guess I was a graduate student by then--a couple of black persons who sometimes I would help. They might have been majoring in chemistry. One of them majored in chemistry; one of them was majoring in something else. I would help them in chemistry. One of them graduated, I believe, in chemistry. I forget who was the other one I worked with. But I don't know; I guess it wasn't that I was trying to persuade any of my friends or others to go to Cal. I was not at the stage where I tried to persuade them to stay in school, go to school and so forth.

Morris: Your own life was enough to deal with.

Ferguson: Yes.



## V EXTRACURRICULAR PROFESSIONAL ACTIVITIES

### American Chemical Society Education Program

Morris: When did you get active with the American Chemical Society? Was that something a young Ph.D. does automatically?

Ferguson: I guess I got into ACS activities after publishing my first book, which was on physical-organic chemistry, and a couple of chemical education articles.

Branch and Calvin, with whom I had done my dissertation and project research, had published a book on physical-organic in 1940 or 1941, and there were a couple of other books in the field published in the forties. Books in chemistry only last three or four years before they need to be revised, and then there was also a need for some updating in physical-organic. So my book sort of filled that void in the field.

The book and articles were quite timely and drew considerable attention which started me on another fortunate cycle that carried me quite a ways. This opened up opportunities to participate in various chemical education activities leading up to the chairmanship of the Division of Chemical Education of the American Chemical Society and the chairmanship of the Southern California Section of ACS, and also led to invitations to serve as a visiting lecturer in programs sponsored by the National Science Foundation, the American Chemical Society, the United Negro College Fund, the Woodrow Wilson Foundation, and the National Institutes of Health. These activities eventually led to appointments to various advisory boards, such as the ACS Petroleum Research Fund, the Chemistry Graduate Record Examination Committee, and others.



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Ferguson: The Petroleum Research Fund is funded by certain industries and provides financial support for programs related to petroleum. But anything in organic chemistry can be related to petroleum, so a wide range of research is supported. They give several million dollars each year for those grants.

Morris: Through ACS.

Ferguson: Yes, through the American Chemical Society. Different levels; there are grants for persons who are just getting their Ph.D.s, and then the mature researchers at the colleges and universities which do not have a graduate program or do not offer Ph.D. work. Then there's another group, those at major universities offering Ph.D.s. So you are competing at your own level for these grants.

#### Government Programs and Advisory Panels

Ferguson: I also served on a number of government advisory panels, such as the U.S. National Committee to the International Union of Pure and Applied Chemistry, the NIH Medicinal and Organic Chemistry Review Committee, the National Institute of Environmental Health Sciences, and the Department of Commerce Sea Grant Review Panel.

Morris: Sea grant?

Ferguson: Yes, college sea grant. Many persons are familiar with agricultural colleges that are what is called land-grant colleges. This is a parallel. In 1968, Congress established the sea-grant program, which supports a wide variety of things that are related to water activities, for sport fishing as well as developing fish for food resources, and also research in universities related to anything like getting minerals and so forth out of the ocean. That was interesting because often our meetings were in these places. We met up in Alaska. Alaska has a program. We met at places along rivers, along seas. At universities that are especially on our East and West coasts, each of those states has a sea-grant college, just as many states would have a land-grant college. UC San Diego is the major one in California. There are others, one at Humboldt and so forth. But anyhow, that was interesting type of work.





Another panel was the National Cancer Institute Chemotherapy Advisory Committee which probably was the most interesting to me because it led to my following up with that. Somewhere around 1972, the National Cancer Institute wanted to add an organic chemist to its advisory panel. For some reason, my name came up. So I was invited to join. There was one other organic chemist on the panel already who did a lot of research in that field. I hadn't been doing research. I knew nothing about cancer or chemotherapy at that time. But being on the panel, of course, that meant that I had to learn a lot fast.

Morris: They do expect you to really be up on their subject?

Ferguson: Not that they expect it; I wouldn't be able to do a good job if I didn't try to see the connection between organic chemistry and the panel's goals. Then in 1973, the Soviet Union and the United States were interested in developing a cooperative program in cancer chemotherapy, so a committee of four of us, two cancer institute staffers, the other organic chemist and myself, went over to the Soviet Union and we spent a month. We went to about five different cities, going to some of their cancer hospitals and some of the cancer research centers. They would tell us what they were doing and we would tell them some of what the United States was doing in cancer chemotherapy. So that trip also gave me a foundation for learning more about cancer chemotherapy, of course. Then in 1974--.

Morris: Was that at the Soviet Union's instigation or was this sort of ongoing cooperation between the two countries?

Ferguson: I'm not sure who first initiated the action. I know that the Soviet Union and the United States had been cooperative on other things like psychology and some other areas, e.g. agriculture. So they wanted to establish one in cancer chemotherapy. Who first initiated it I don't know. In 1974, we went back to sign the agreement. A larger group went, of course, the head of the cancer institute--our cancer institute--and we met with their representatives. Some of our spouses went and I even took my daughter. She was just turning thirteen, I believe. So my wife and daughter went. Of course, that was another opportunity for my daughter to extend her traveling.

Morris: To check out the rest of the world.

Ferguson: Yes, because she had already been around the world. When we went to Africa, we went from Los Angeles to New York to Senegal, which is in West Africa. Then, we took three weeks traveling across Africa. When we came home--well, it turns out that Nairobi and Los Angeles are almost on opposite sides of the



globe. So we just kept going east. We went through India and Japan and Thailand and so forth, so she got to see a lot of different cultures. On the trip to Russia, she also got to visit London, and Paris.

Morris: Did she decide to do international law as a consequence?

Ferguson: No. I guess at one time she considered welfare. She graduated here. Her B.S. was in public welfare and economics. She learned to like economics and she even considered going for her Ph.D. in economics but she would have had to take too much time with the undergraduate economics to build up the foundation. She doesn't want to practice corporate law. She likes these other types of activities in law.



## VI CALIFORNIA STATE UNIVERSITY AT LOS ANGELES, 1965-1986

Minority Recruitment: National Institutes of Health Support

Morris: Let's go back a little bit. What was going on that made 1965 a good time to move over to Cal State University?

Ferguson: Actually, I had spent three summers working as a visiting professor at the University of Oregon in Eugene. Of course, that was like a paid vacation to come back to California and bring my family. We were traveling across country and we drove each time. Each time we would drive a different route. Then we would spend several weeks here in California at the end of the summer. So my family and I all were partial to California living.

Just about that time, there was an announcement of an opening for a visiting professor at Cal State L.A. I applied for that and got it. It just turned out that we became mutually interested in each other. We liked the department and they were happy to have me join the department. They offered me a full professorship with tenure, and so we stayed.

Morris: That is pretty speedy, isn't it?

Ferguson: Of course, I already had tenure at Howard but it was a break to get tenure and not to have to go through a year or so--.

Morris: Was Cal State by that time beginning to look for expanding the number of minority faculty?

Ferguson: A little bit. This was in 1965. We came here just after the riots and just before the riots in Washington so we missed both of them.

Morris: Good timing.



Ferguson: There wasn't an aggressive action to get African Americans yet or other minorities, but shortly thereafter there was a strong program at Cal State to increase both the students and the faculty members. So by 1968, I think we added another--. I guess that was just when I became chairman. We added another black fellow and a couple of years later, we added an Hispanic and a female Asian. And later, another female. So our department there at Cal State L.A. was fairly aggressive, one of the leading aggressive departments to add minority faculty and then to go after minority students.

Morris: Had you or your wife or any of your kids been involved in the NAACP or other civil rights, equal opportunity projects?

Ferguson: No, not really. For quite a number of years, I had been going around talking at different places to try to interest minorities to go into science as a career, pointing out some of the advantages and opportunities. But we weren't active in the NAACP or any of the national organizations of that type, although we were members and supported them financially.

Here at Cal State, in 1971 or 1972, the National Institutes of Health started a program called the Minority Biomedical Research Program, the MBRS. That's right, in 1971-72, I was away on sabbatical, and our chemistry department there at Cal State applied for a grant to get involved in the program. It was just after I came back that they made a site visit, that is, NIH made a site visit to consider whether they would start a program there.

Morris: At that point did NIH just want to increase the number of black students or was it also to increase representation on campuses with mostly white students?

Ferguson: Well, Cal State L.A. was one of the larger campuses in terms of the numbers of minorities--Hispanics and Blacks and Asians/Pacific Islanders--that were enrolled. That number was equal to many of the black institutions or the Hispanic institutions in New Mexico and Texas. So in terms of numbers, we had equivalent numbers but the percentage was much lower than at the minority institutions.

Morris: That's an interesting distinction.

Ferguson: So they were quite concerned. After all, it is a state-supported school. Why should NIH put money into it. Let California do that rather than the federal government.

Morris: This is NIH's attitude?





Ferguson: Well, to help minorities. Anyhow, they came out. I had not been in on the initial proposal because I was away but it just so happened that when they came out for the site visit, I had come back. They urged me to serve as program director. They thought it would be better to have a minority as program director.

Morris: So you got to take them on the site visit?

Ferguson: Yes, I participated in the site visit and then the arguments for having it there and so forth. What we did was essentially point out that the minorities that we did have were at a disadvantage relative to the general public in the L.A. area as far as economic concerns. Even the Asian students were at the low end of the income scale.

Morris: Did you draw a lot of students from the Watts area?

Ferguson: In that program?

Morris: To attend Cal State L.A. in general.

Ferguson: Eventually. I wouldn't say a lot, but quite a few of them were from the Watts area to come to Cal State L.A. It was a way of getting the students to come to Cal State L.A. for one thing. They would have long bus rides and so forth. The campus was really in the Hispanic area of L.A.

In fact, when the present president was named, the Hispanics were very displeased because they felt that this was their institution. It's in their barrio, their region, you see. But anyhow, so we started. We did get a grant. It was one of the larger grants in the NIH program. Of course, we would have annual meetings of the program directors.

Morris: Of the different programs around the country?

Ferguson: Yes, around the country, because most of those programs were in the black colleges. A couple in Hispanic colleges like in Texas and New Mexico. And Indian communities--.

Morris: American Indian?

Ferguson: Yes, The Native American Indian community had a grant. Our main thing was defending why Cal State L.A. should be in the program. Eventually, programs were started in New York, because there are a lot of Puerto Ricans there. They are at a



disadvantage economically, jobwise, and so forth, just like African Americans were in Watts.

Morris: But most of the programs funded by NIH were private schools?

Ferguson: No, private and state, but minority institutions. I mean, historically they had 80 or 90 percent minority students.

Morris: So that CSULA was the only school that had a majority of white people?

Ferguson: It was the first. Eventually even Cal State San Jose got a grant. Theirs was mostly in psychology but they pushed forward and got a grant.

Morris: Yes. They have a big Hispanic student population.

Ferguson: In fact, the program was extended to junior colleges. East L.A. got a grant. Since it is close to Cal State L.A., there was a lot of collaboration between the two programs.

[Interruption]

#### Encouraging Science-Based Careers: ACS Project SEED

Ferguson: What were we talking about last? MBRS involvement? Oh yes, the MBRS program is responsible for literally hundreds of students, say from Cal State L.A., going into science-based careers. Several of those who got into the program and went on to graduate school become university professors themselves, and many of them became physicians, dentists, pharmacists, veterinarian scientists, and medical technicians. These are minorities who probably wouldn't have done this if it hadn't have been for the MBRS because, first of all, they wouldn't have had the funds. You see, the MBRS provides the undergraduates something like--well, it has increased; at one time, it was \$3,000 per year. It is more now; to do research, say fifteen hours a week during the school year and full time during the summer. The graduate students get even more, plus their graduate school fees. So it is a way of actually being paid for working in your field.

Then you get the inspiration from the program directors, the faculty members. Being close to a faculty member, you get a good recommendation to go to graduate school and so forth. It has been very successful in that sense. It has been located at



something like, oh, how many institutions? I would say between fifty and sixty schools around the country.

Morris: That's quite a sizeable program.

Ferguson: Yes. It runs quite a few million dollars a year.

#### ACS Project SEED: Doctoral Student Assistance

Morris: Did the MBRS program come before or after Project SEED?

Ferguson: Let's see. Project SEED came first, in 1968. Just an informal group, several professors and others, on the ACS staff met, to sort of plan some of the features and scope of such a program. At that time, Project SEED stood for Support of the Educationally and Economically Disadvantaged. This was in 1968, right after the Watts and other riots. ACS wanted to get involved.

Morris: And after Martin Luther King's death, and things like that.

Ferguson: Right. The ACS wanted to help. This was the largest and first of the major societies to get some type of civilian support for that type of activity.

Morris: Were you prodding or was there somebody else that you were working with to encourage this?

Ferguson: Well, I really don't recall now who initiated it. Someone there at ACS, I think, probably thought that this would be a good idea and invited several of us to come in and talk it over. We did, and just kept on pushing. Finally, ACS set aside a certain amount of money for the program. In future years, they prodded industry, corporations, and members to support it.

At that time, we had five or six different types of activities. It supported faculty members in black institutions. It paid for these professors to take the courses that are given by the American Chemical Society at their national meetings. They give refresher courses in various phases of chemistry and technology. But they paid the fees for faculty members and minorities in developing institutions to attend.

And one other thing: we arranged for retiring professors to donate their books to the libraries of some of the minority institutions, and we would pay for the shipping and so forth.





Morris: To go to smaller and newer schools?

Ferguson: To send them to small schools. We paid for some of the students at those schools to exchange with major universities during the summer. We arranged for faculty members at some of those institutions to spend some time at a major institution or vice versa, for some of the major faculty members to spend some time at minority institutions. Plus the summer program.

In later years, all of those features were dropped except the summer program, so that it now stands for Summer Education Experience for the Disadvantaged. Here is a little blurb I just happened to pick up from the SEED Program.<sup>5</sup>

Morris: Oh, good. So now it's primarily a summer program?

Ferguson: A summer program. But there are quite a few students. They have extended it so that some students can go a second summer, spend time at a university or industrial lab doing research. It gives them motivation to see whether or not they like chemistry. If they do, to give them some inspiration to do their best.

Morris: Back in 1968, when it was getting started, how did you go about recruiting youngsters to come into the program?

Ferguson: One thing, three or four of us worked on it. I had been at Howard. Sam Massie was from Fisk. There were a couple of other black faculty members. We were more familiar with the black institutions. Plus one from Puerto Rico. I'm not sure there were any from the Hispanic schools at that time but soon they were added to the committee. So it was not hard to make contact with the black institutions.

We concentrated on them. To get them interested. To let them know what was available.

Morris: I was thinking about also going out and finding youngsters. Would you, say, go to Watts to recruit students?

Ferguson: This was, at that time, completely in the Southeast. The black institutions and a couple of the-- One Indian. Let's see. Really, even Puerto Ricans weren't in it then. It started mostly at the black institutions. But in later years, it began to spread out so it reaches all over the country.

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<sup>5</sup> See appendix.





Morris: What worked in getting kids to sign up for the program?

Ferguson: It has to be faculty members at the institutions. In recent years, faculty members, particularly those who have research grants from the Petroleum Research Fund-that's the ACS program we mentioned earlier--these faculty members are alert to potential students. It is not so much going into Watts to pull out students, rather, we would go around to high schools in the area and talk with the students and faculty. Hopefully, through the teachers, some students would apply.

Morris: Youngsters who are enrolled in science classes?

Ferguson: Yes, right.

Morris: So you already have a pretty good idea that they can deal with college-level material?

Ferguson: Yes, at least they have the potential to do so. Now, for example, at Cal State L.A., we have several faculty members who are liaison with local high schools. There will be a couple of faculty members associated with schools in the Watts area, in the Hispanic area, and so forth. These are the key persons who talk to the high school teachers and ask them for recommendations of students to participate.

Morris: Okay. So it is the high school chemistry teachers and physics teachers who choose the students?

Ferguson: Right. We take their recommendations. Usually there is a form that the students fill out. Usually we accept the recommendation of the high school teacher because that person knows them best, their potential and so forth. There is a screening committee at the college, of course, which selects the students to be admitted.

Morris: Any surprises in the kinds of young people?

Ferguson: In the end, the college faculty members are usually impressed with the enthusiasm and the ability of the high school students. Once you have done it for some years, you find out they have inquiring minds: they ask things you don't expect them to ask and they even sometimes challenge you. A question pops out that you hadn't thought about. And they follow directions well. So it has been a very pleasant experience for both the faculty members and the students.



Very often it is even a way of recruiting students to the campus, because they are quite likely to go to the school where they had the SEED experience when they go to college.

Morris: If they've been in this summer program, particularly if it is known that there is some financial assistance?

Ferguson: That's where MBRS is able to come in and pick them up. Quite a few of the MBRS students were persons who were in the high school program and they have got a little experience in the lab and so forth. Normally, MBRS doesn't take freshmen, but they will take some of the freshman who have been in these programs because they have had some laboratory exposure.

Morris: So it's kids who have already self-selected themselves enough to get into a high school science class and do well?

Ferguson: Yes, right.

Morris: Did you ever work at all with counselors to try to identify high school students who might do well but who haven't yet ventured into a science class?

Ferguson: Not directly with a group of counselors. I remember attending one meeting where we invited counselors and talked to them about science careers, but that was just one isolated occasion. We do go into the schools and give talks--high schools, junior highs and elementary schools. We give talks about science as a career. We don't expect all of them to be scientists but we give it a shot, give them their chance. That's why we encourage them to get involved in science fairs, so that they can get some exposure to doing science experiments.

Morris: Are the science fairs something that also started with ACS?

Ferguson: Oh, no. That's something that has been going on for years. Science fairs have been held for quite a while so, the ACS can't claim any direct responsibility there. Faculty members who get involved in some of these activities often become really committed to seeing these young people develop the skills to make it in college and go on into a science career.

Morris: Have you got any statistics or any sense of how many people have gone into chemistry as a result?

Ferguson: Success?

Morris: Yes.



Ferguson: Well, the MBRS program, yes, they have. The program itself has a lot of statistics and it is overwhelming how successful it is. It has to be successful in order to get funds out of Congress continuously. The money comes from NIH and therefore is appropriated by Congress. Periodically, we had to write letters to congressmen so they would keep appropriating funds for the MBRS program.

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Ferguson: Then a sister program to the MBRS is the MARC program. Minority Access to Research Careers is what it stands for, MARC. This probably started five years later or something like that. But it's goal was to get students into doctoral programs. The MBRS goal was to get them into any biomedical program--.

Morris: At any level.

Ferguson: Yes. In other words, go into the professions. Physicians, dentists, veterinarian scientists, pharmacists, et cetera.

Morris: Lab technicians?

Ferguson: Yes, medical technicians. MBRS included graduate school too, but the emphasis was getting minority students into these biomedical professions, whereas MARC was specifically designed for going on for the Ph.D. It is a small program, but they parallel each other. Now, MBRS is putting a little bit more emphasis into graduate school; so these are both doctoral programs. They both have funding for the doctoral program aspect of it, because in order to get a teaching position nowadays you almost need a post-doctoral exposure.

Morris: Because the number of Ph.D.s has increased over the years? How does one qualify for either of the doctoral support programs?

Ferguson: It is done through competitive application, jointly to the NIH program and to a university faculty member well established in research.

#### Chairman of the Chemistry Department: State of the Profession

Morris: While you were chairman of the chemistry department at Cal State L.A., how much of your time was spent on this kind of recruiting and developing of minority students?





Ferguson: While chairman, you are relieved of teaching assignments, although I continued teaching one graduate course. So most of your time is spent on department affairs on all committees, and also thinking of ways to attract more students to the department. Chemistry departments all over the country have been suffering in the last ten years or so as far as the number of students and possibly quality of students going into chemistry. So there is a big challenge to compete with other schools.

Morris: Why is that?

Ferguson: Well, I really don't know. The image of chemistry in the public eye has somehow steered or misdirected some of the students away from the field. Now, biochemistry has maintained high interest. It might be that the chemistry profession has some of the public afraid. When you say chemistry or chemicals, they think of toxic chemicals always. They always think of the hazards of chemistry instead of thinking of the good things that chemistry has done, the beneficial things that can derive from chemistry.

I think that just the term chemistry or chemicals has turned a lot of students away from thinking of that as a career. They don't think of that as a helpful field. I think that that has had some influence on the thinking of youth when they are deciding early what field they might want to go into.

Morris: Is this what you hear from your students?

Ferguson: No, that's what I hear from other faculty members themselves, and some of the industrial people. They are concerned, and the ACS is trying to stress to the public, an awareness of the benefits that chemistry provides and not think in terms of the toxic chemicals that you are reading about always.

People think of the atomic bomb and they think about other explosives or they think about the toxics--the polyfluoro hydrocarbons and so forth. We need to get the public to think of some of the beneficial things. If it weren't for chemistry, agriculture would have suffered. There are good things for agriculture and, of course, there are toxic chemicals for agriculture. Here you have to stress the positive.

Morris: That is something that you have written about. I was entertained by the titles of some of the articles in your vita.





There was an article on goblins and angels in organic chemistry.<sup>6</sup>

Ferguson: Yes, maybe so. When was that? In the fifties, I guess, when [Rachel] Carson came out with the book, Silent Spring, about the insecticides and so forth. That started people thinking about the ill effects of insecticides and chemicals. And the fact that many toxic chemicals have been thrown along roadsides and that presents a health hazard. So the profession of chemistry has been fighting that image ever since.

### Teaching and Research Interests

Morris: You mentioned that you kept on teaching a graduate seminar even while you were department chair. Were you particularly interested in teaching about bioethics or problems of chemical toxicity?

Ferguson: No, not really. Mostly I guess just in physical-organic as a topic. I liked it. I liked particularly looking at some of the biological effects of organic chemicals, the good properties. Like for example, taste. What are the molecular properties of substances that elicit a certain taste, particularly the sweet taste. What is the nature of the interaction.

The same thing with cancer chemotherapy. What's the mechanism? How do the chemicals react to lead to a cure of cancer? Plus, we also want to know why certain chemicals produce cancer. We are interested in both mechanisms. One of the interests I had was in trying to determine what properties can be associated with what biological activities. Taste and cancer chemotherapy were two such areas in which I became interested. What molecular properties? What's the process? What happens on your tongue when you taste something? What happens in the cell when you take drugs to cure cancer? What is the nature of the process?

I enjoyed such courses. They were usually advanced or graduate level.

Morris: Taste sounds like something that might not have had too much research done on it over the years.

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<sup>6</sup>"Organic Chemicals: Angels or Goblins," Journal of Chemical Education, 55, 553 (1978).



Ferguson: There is a lot of research without perhaps a lot of progress. It is still very hard to explain the mechanism of taste. Even just recently there have been a couple of discoveries of certain proteins that are involved in the tasting process that they say are related to sight. No. I think it was related to a couple of processes in sight. A couple of proteins that are there. Of course, taste is not often related because the flavor of a food involves both smell and taste. But you can taste things that have no smell. So there is a separate process that is involved. That was always a lot of fun, trying to correlate some of the properties of the substances with their tastes.



## VII REFLECTIONS ON A LONG CAREER

Partnership with Mrs. Ferguson: On Being a Role Model

Ferguson: I guess as far as any contributions that I might have made, I think most of it has been concerned with getting more minorities into science careers. Throughout my life I have been carried on a cloud of good fortune. One thing, my family encouraged me to go to college even though no one else in the family had been to college. They did offer me encouragement. Then I was lucky in having a job that could support myself while going to college and meet other expenses. I had good teachers, both in high school and then good teachers at Cal, one of the leading universities. Also my wife and children were very tolerant because I would be away from home a lot, either on speaking trips or on these other panels.

So my wife had to handle the children alone even though she worked. She worked at the Library of Congress for a while when we were in Washington. Then she went into teaching. Then, in Los Angeles, she became a resource specialist for the L.A. Unified School District, which position she retired from. She was teaching students with learning disabilities. She enjoyed that work. But then when I retired, she retired.

Morris: Sounds like she would have had some of the same interests you did in terms of keeping kids in school, encouraging them?

Ferguson: Yes. Especially in setting the family expectations for our children that they were going to go to college. Just the way they went to grade school, going to college was the same thing.

Morris: Did she have time to get involved in their school activities or community things?

Ferguson: Yes, always the PTA and things like that. A lot of that. Now, our grandchildren, as I said, are headed for college. My older son's wife is a lawyer. She got her undergraduate and law



degrees at UCLA. My other son's wife got her degree at Pomona, I believe. They are all well aware of the need of a college education and benefits of a college education.

Morris: As you went along, did you and your wife see as part of your responsibilities as setting an example for--?

Ferguson: The family?

Morris: Well, for other kids too, other minority kids, in terms of we've made a successful professional life; therefore, if you want to, you can do it too?

Ferguson: We didn't go out to do any, you might say, talking to other students, that "here we are role models." We are always driving home the need and the benefits on a job, of a college education. Also college for the sake of learning, in addition to earning a living. The fact that we did go around to the schools where our children went and every once in a while, it would come up that we ourselves were teachers, that would sometimes perhaps affect one or two students.

I think my value as a role model in these different teaching, or speaking, situations was helped by the fact that I was featured in that CIBA-Geigy Series. Did we send you a poster?

Morris: Yes, you did. It is a really nice poster.<sup>7</sup>

Ferguson: Often when I go to a school, or just various places I might be, students will come up and say, "Oh, I saw your picture." Or if I go to a school to talk, usually that teacher would have had it up on the bulletin board. And the students just develop some enthusiasm or interests. So that makes it more effective in speaking as a role model.

I frequently have this same experience in the Los Angeles area as a result of two exhibits. One is the "Black Achievers in Science" exhibit which was held at the California Museum of Science and Industry in 1989. The exhibit toured major museums around the country for about two years and is now housed in the Museum of Science and Industry, Chicago. A second exhibit, "Positive Images" featured African Americans who have made contributions to California history, and was held at the California Museum of Afro American History and Culture in 1983. I overheard a humorous comment at the museum exhibit in 1983.

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<sup>7</sup>Copy in supporting documents in The Bancroft Library.





One of my books was on display, both the English and the Japanese editions. I heard one spectator say, "Gee, he can write in Japanese too," not realizing that the Japanese edition had been translated by the Japanese. Often, students, as well as others, tell me they have seen my picture in these places.

Morris: It stays with them.

Ferguson: Yes, and that helps my presentations. Or sometimes, we have been written up in books on black scientists or authors. For example, there is a book recently published called Blacks in Science and Medicine, by Vivian Sammons,<sup>8</sup> and an old one Great Negroes. Past and Present, by Russell L. Adams.<sup>9</sup> As these books get around to teachers and they show them to their students, then if I happen to come by and give a talk, it makes it more impressive.

Self-Help Projects: National Organization of Black Chemists and Chemical Engineers. 1972-1992

Morris: In the years that you have been working on these programs, have you noticed any change in the minority students that you have come in contact with? Are they better prepared or more interested or taking things for granted?

Ferguson: It goes up and down. I think right after the Martin Luther King period, there was much more enthusiasm and hope that the students would be able to get support. In this past decade, I think that has fallen off.

With the current national administration, there is a little less financial support which provides more excuses for institutions and individuals to give less support to minorities and women, even though I think that there still is a pretty strong drive. I think that the opportunities for minorities and women to go into science as a career are quite good, mostly because minorities and women are helping themselves. Almost every minority national organization, the fraternities, sororities, and minority societies, like the Society of Black Physicists, the Society of Black Engineers, the National Organization of Black Chemists and Chemical Engineers, there are

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<sup>8</sup>Hemisphere Publishing Corp., New York, 1990.

<sup>9</sup>Afro-American Publishing Co., Chicago, 1964.



several, has a social-action program. There is one called the Hundred Black Men. There is one called the Links, an organization of women. There is another one called Sigma Pi Phi, an organization of professional black men.

All of these organizations, fraternities, and sororities are doing things similar to those by the National Organization of Black Chemists and Chemical Engineers: providing role models, tutors, mentors, funds for the students to visit libraries, laboratories, court houses, museums, and help in the preparation for the SAT or the MCAT and other tests. All of these activities are focused on elementary school through college, all directed toward getting students to go to college and stay in college. This has really expanded in the last five years or so. I think that is having a big impact on minorities and women going into science-based careers.

A word about the National Organization of Black Chemists and Chemical Engineers; I am quite proud of it. As I mentioned, I was one of the co-founders. Back in 1972, we met, a group of us. About eight or ten of us.

Morris: In somebody's living room?

Ferguson: Yes, in somebody's living room. We got some money from the Hass Chemical Company to help provide expenses to get there, travel expenses. It wasn't really much; it wasn't adequate but we didn't mind putting up some of our own funds. We met and laid out the plans for the organization and some of the activities that it might be involved in. Now, I'm proud to say that after twenty years, it has a national meeting each year at which they have guest speakers. They have forums for discussing important issues. They have provided graduate fellowships for African Americans in chemistry or chemical engineering. They have student members. They schedule a student college bowl, and science fair activities. They have a general clearinghouse of professional openings. They have some six to seven hundred in attendance at the banquet where they give awards.

Morris: All this activity directed toward the coming generation, helping people who will go into this profession?

Ferguson: Yes, right. Highly technical papers. A lot of the black chemists and black chemical engineers will give very good technical papers at these meetings and then they publish them in a bound issue. It has an organizational structure comprised of national, regional, chapter, and student chapter divisions. There are about a half dozen student chapters, including one at Michigan State University.



So it has gone along quite strongly in twenty years' time. I might say that the Puerto Ricans have an organization similar, not quite as large, or as strongly structured, but they do have an organization. There is one among Hispanics and Native Americans. It is called SACNAS, Society for the Advancement of Chicanos and Native Americans in Sciences.

Morris: How big has the National Organization of Black Chemists and Chemical Engineers grown to be?

Ferguson: At these meetings we have 600-700 in attendance. I don't know what the membership is. I believe they say they have over 500 paid members.

Morris: Then there are a couple of hundred other people--.

Ferguson: --who come to their meetings to hear and participate.

Morris: That would be the majority of African-American working professionals in the field?

Ferguson: Right. Also the fact that they had contact with AAAS [American Association for the Advancement of Science], NSF, and NASA [National Aeronautics and Space Administration]--

Morris: So this is a clearinghouse for professional opportunities?

Ferguson: It is the organization approached when Congress or other agencies want to contact a society to get input from African Americans in science and engineering. It is the major society to which they turn. For example, some years back, fifteen or twenty years back, the National Science Foundation provided funds to universities that they called--what did they call them? Centers of Excellence. There were a dozen to twenty universities throughout the country where they poured in a lot of money. They were already the top centers of education; they gave money for different science research programs. That meant that the developing colleges weren't eligible. They weren't even in it.

So we persuaded Congress to set aside some money in developing additional, smaller institutions to act as science centers. The first was set up at Atlanta University, mostly for black students. A little bit later, one was set up in Puerto Rico for Puerto Ricans. Later one was set up in New Mexico for Hispanics. These centers provided funding to faculty members from neighboring developing colleges--we say developing colleges because they didn't have to be African American--most of the





people were African-American that went to Atlanta; most of them were Hispanic who went to the one in Texas. But by law they couldn't discriminate on the basis of race.

So the faculty members would go there during the summers to do research. These centers would hold Saturday academies for students, elementary to twelfth grade. They provided mostly the things that we mentioned already, tutors and so forth for students in the general area, several states involved. This was something that the NOBCChE, this National Organization of Black Chemists and Chemical Engineers--

Morris: I was waiting to see if you had an acronym for it.

Ferguson: Yes, it is NOBCChE. We went to appear before Senator [Edward] Kennedy and persuaded a committee to persuade the National Science Foundation to set aside some funds for these types of centers. They only did it for maybe five years. But recently, they have started another source of funds to do something similar. It hasn't really developed firmly but at least it is something NOBCChE has initiated. The fact that some of the members have nice positions in industry, that's the way they were able to persuade those industries to provide funds for graduate fellowships for, say, in this case black chemists.

Morris: Did these institutes at these developing schools pick up some different kinds of youngsters coming into these Saturday institutes?

Ferguson: Well, they picked up a lot of youngsters who wouldn't have perhaps gone on to college or, even if they went into college, go into science. At these elementary levels, the emphasis is stay in school, go to college. Not so much just science.

Morris: Just learn to read and write and do math.

Ferguson: Yes, and go to college.

Morris: But you were out there in the back yard making Clean-O and Lem-O when you were in junior high.

Ferguson: Just happened to be lucky. I was having fun with it.





Student Ratings: Helping Students Learn

Morris: You are reported by some of your students to have been a tough taskmaster. Does that mean you were hard to get along with in the classroom?

Ferguson: No. I think that organic chemistry happens to be the course that any student going into medicine, dentistry, or any of the medical sciences, has to take. That is sort of the point to squeeze out those persons who probably would not make it into those biomedical sciences or straight chemistry. I think organic chemistry teachers as a whole just are reported to be kind of tough, because quite a few students who don't do well in organic are weeded out.

Also, organic chemistry involves a lot of memory. That means putting in a lot of individual effort. The student can't get by on just reasoning it out either. You really have to remember a lot of names and reactions and so forth to do anything. That is the stage where you require the student to put in some special effort and time. In general chemistry, it is possible to learn some of the principles. If you are good in algebra or something like that, you can get by. You don't have to remember a whole lot. But in organic, in order to do anything, you really have to remember a lot, which means individual effort. Students are inclined to think, "Boy, he really makes me work," and so the organic teachers get a reputation of that type.

Morris: What kind of techniques have you developed for--?

Ferguson: Handling students?

Morris: Yes.

Ferguson: I try to encourage them. I tell them to study with one or more students because in doing so, instead of just reading it using sight, you get to speak it; you get to hear it.

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Ferguson: The more senses you use, the longer you remember it. Organic is, as I say, something that involves memory work. One other thing that many organic chemistry teachers do is to give weekly quizzes, frequent quizzes. Quite a few of them give them unannounced so that the student has to study steadily and continuously rather than hoping to study just before the



midterm. If you study steadily you are going to remember it longer, you are going to do better in organic.

Morris: Get it into your brain better?

Ferguson: Better. Also, by studying with more than one person, with another person at least, that person who you are studying with, or the group that you study with, may have caught some point that you missed. They may ask questions that make you think, to try to answer. So you get some breadth in your studying. Again, it means that you are more likely to succeed.

Morris: Does it work better for students to self-select their study group or do you just randomly--?

Ferguson: I guess it helps to self-select in the sense that you get along well. Also, hopefully, you are comparable in covering the material and learning it. If you are just absolutely--. If you don't understand it with that group, you will be left behind. You have to be able to participate in the study exercises. In that sense it helps.

Another thing I tried to always impress upon my students was that I was there to teach them. I wanted to see all of them do well. I wanted to see all of them pass. So instead of having set office hours, I don't mind if they drop in. Even though I post office hours, I'm there. Any time I'm there, come in and ask if you have a question. So I tried to be sure I was there for any time they needed help.

Morris: Many of the equal opportunity and minority enhancement programs have relied a lot on tutorials and supplementary assistance. Does that differ from this study group idea? Has that worked for minority kids or do other things work better?

Ferguson: I think it works, whether minority or not, for those students who really have no idea of what they are trying to learn; so that the tutor sort of gets them on track. Then, from that, they can hopefully join a study group and take off for themselves; the tutor helps them over the basic ideas that they may have missed or just don't understand or aren't prepared to get just through class. And also gives them a little inspiration that they can do it.

Morris: So motivation is important?

Ferguson: Right.



Ferguson: Yes, those who come in to see me and they don't know anything, I would try to set up a tutor for them depending on how much help they really need. If it is clear that they have the background, but just haven't caught some of the points, then I can work with them and so forth. But if they need more drill work, then I try to provide a tutor where they can spend more time with help.

Morris: How does it work if somebody has needed a little extra help, then you feel like they catch up, can they add themselves to an ongoing study group or does that make it awkward for the new member of the group?

Ferguson: No, I try to guide them. I'll mention one or two persons in the class. "They're studying; why don't you join them?" Or introduce them and so forth. And try to help in getting students into study groups whether it is one person or whether it is three.

Morris: So you are using some of those psychology courses you took.

Ferguson: Perhaps so.

Morris: A little human relations.

Ferguson: Maybe so.

Morris: Over all these years, are there some of your students in particular that you recall that you have been especially proud of or have made a mark in their own careers?

Ferguson: Oh, yes. One of my students has become president of the National Association of Orthopedic Surgery. I'm not sure just the title of it. He is actually now dean of medicine at Howard University.

Morris: Wonderful!

Ferguson: There are quite a few who went on to get their Ph.D. or other degrees, a host of people in medicine. When I go to L.A. or even up to the Bay Area--Where are we right now? We are in Oakland. In Sacramento where I live now, I've joined the Sigma Pi Phi, which is an organization of professional African Americans, mostly physicians or dentists. A couple of the dentists and physicians in that group were former students, that is in the sense that they took organic chemistry with me at one of the schools. The same thing with L.A.; almost any place I go I'm running into physicians or dentists who took organic with me at Howard.





running into physicians or dentists who took organic with me at Howard.

You see, for a number of years, there were just two black medical schools, Howard and Meharry.

Morris: And no others that would just accept a black student even though qualified?

Ferguson: It wasn't quite that bad. It's just that a lot of them went to the black colleges. Some went off to the major universities to get their degree but many of those students came to Howard for the undergraduate school and even quite a few then at Cal State L.A., so that quite a few of them were in my undergraduate classes. Some of them even a little bit higher. So I run into those people frequently.

#### Changing Job Opportunities

Morris: It sounds as if a larger number of black men and women have gone into medicine rather than other aspects of science. Is that true? Is there any special reason for that?

Ferguson: Well, for years, parents directed their students into medicine, a smaller number into dentistry, because up until the forties or fifties, there just wasn't much of a job opportunity in science. Even lawyers had a hard time getting clients. One of the fields that they could prosper in was in medicine and dentistry.

So that quite a few of the black students who went to college, if they went into a science-based field, they went into medicine. To get into medicine they had to go through organic chemistry so there were quite a few of them in my classes.

Morris: I was reading a very interesting article a couple of days ago by a corporate personnel man; he was writing about twenty years ago and he said that the most important task facing industry was to bring in minorities and it was also the hardest task for corporations to do, to integrate the executive ranks. I was wondering if that was true from your experience? There seems to be no problem nowadays getting business to put money into the training program.

Ferguson: Not now, but there was then. Before, say, Jackie Robinson's time. Up until the forties, professional jobs were scarce. Professional opportunities for minorities were rare. They could





only think in terms of barbering, plumbing or something like that, where they could service black families and so forth. Not even professional sports. So then, when Jackie Robinson came along, that opened up the opportunities for African Americans in professional sports.

But not until Sputnik in the fifties were there opportunities for minorities in science and business and politics. When the country needed scientific personnel, then they began to give minorities a chance to go to school and the encouragement and funds to go to school, and women too.

Then in the sixties, the social revolution, Martin Luther King [Jr.] and the riots and so forth opened up opportunities for minorities to get jobs in business, in science, engineering and other fields. Government and industry began to provide funds for them to go to school. By law, industry had to provide certain opportunities for hiring. They had to hire a certain number of minorities and so forth.

That opened up opportunities and once the minorities were able to show and demonstrate that they could carry on, then there was some interest in industry in hiring. Of course, it has slacked off a little in the last ten years because government just doesn't exert pressure on industry to continue to do that.

Of course, then there is the question of when is there reverse discrimination and so forth, like the Bakke case. That has raised some barriers to increasing this amount of effort to get minorities and women into corporate-level jobs. But I think with the recent Los Angeles riots [summer 1992], it's opening up the conscience and thoughts of America to ask just where do we stand as far as racial attitudes are concerned.

Morris: Did you feel that the Watts riots in 1964-65 had the same effect in raising public consciousness?

Ferguson: I think it opened up the eyes and conscience of quite a few Americans.

Morris: Rather than frightening people so that they were turned off the problems of poor neighborhoods.

Ferguson: I think that there were more [people] that were affected positively than negatively. The ones who were affected negatively were probably those who were competing for those jobs and opportunities with the minorities and so they felt threatened.



Morris: That's a continuous kind of a problem.

Ferguson: Yes.

Advice for the Future: Inner City Progress

Morris: How have you managed to organize and manage your time so that you have done all these things and seem to keep your hand in so many activities?

Ferguson: Well, I slackened off in doing much the last year or so. I find retirement very relaxing, and it is easy to do nothing.

I was fortunate that my wife would tolerate my being away so much. It would take a lot of time to write, especially to write books. On some of these trips--I guess if I had to do it over again, I certainly would include her and the rest of the family in more of these trips.

Morris: That gives you the opportunity to catch up on your father and husband roles?

Ferguson: Yes, right.

Morris: Have you got any philosophy or advice for working with young people and helping them to enjoy the profession the way you have?

Ferguson: Only in the sense that I strongly recommend that the persons coming through, the students and graduates, that they get into a field that they enjoy. That is one major factor, to enjoy it. I hope as some of the minorities do who come through into their careers, that they do not overlook and close the door of opportunity for other youth who follow them.

I think more and more of the young professionals are doing a lot to help the youth to go to college. Even the professional athletes are putting money into programs to do some of these things. Recently, one of the star basketball players who happens to be from Sacramento--let's see; what's his name?



Kevin Johnson? Yes. He plays for Arizona. He has started the Good Hope Academy in Sacramento. Young minorities can get some counseling and advice, and I guess, any needed tutoring in school--again the focus is to get them to stay in school at that stage.

Other athletes are doing similar things, so that there is a lot more opportunity for minorities to go out there and help. The main thing is for these opportunities to be brought to youngsters' attention, especially in the ghetto or in the barrio where the area doesn't have outlets--some of them don't have movies; they don't have job opportunities--they are just really closed in.

Morris: Isolated.

Ferguson: Right. So this word doesn't get to them, about these opportunities.

Morris: Any ideas about how to bridge that?

Ferguson: I think that some of these minority organizations are well aware of that now and are trying to penetrate that by going in. One of the things that affected, say, the Watts area is that up until the sixties, a few professional people or middle-class blacks lived right there. So that was sort of like a network holding the community together and giving it some hope and aspiration.

But after the sixties, quite a few of the persons who got opportunities to go to college and into a career moved out. That left nothing but the hard core, hopeless, husbandless, the fatherless children in the neighborhoods.

Morris: In that way, you do think that some people have closed the door behind them?

Ferguson: Yes. I think that in the last five years, more of the black professionals are trying to find a way to get back to those areas so that the students do become aware of what the opportunities are. Especially by setting up of recreation centers for them where they can get not only recreation but advice, tutoring, encouragement, big brother associations.

Morris: A new pair of shoes every now and then.

Ferguson: Yes. Like the Hundred Black Men, it's a national organization. One of the things that they have done in Atlanta is provide-- I'm not precise on details, but they chose a group of, I think,





ninth grade students. I don't remember even what the number was, whether it was twenty-five or one hundred. They provided Saturday academies where they would come each Saturday to get tutoring. They provided funds to buy them what they needed, such as a pair of shoes or a coat. They provided big brother images for them so that they would see that there is a hope and a chance for them. They followed that same group all the way through to high school graduation. A high percentage of them stayed in the program and went on to college.

I think the Hundred Black Men are just about to start with a new group. I think they are going deeper. They are going to start with sixth graders, younger children, and follow them through. That's why I am saying that some of these organizations are beginning to penetrate these areas and help the inner-city youth.

Morris: As a chemist, do you have any thoughts on the number of people making drugs and selling drugs, often in the inner city?

Ferguson: No.

Morris: Sort of the downside of what you can do with a laboratory.

Ferguson: I can understand. It is awfully tempting for these inner-city youth to get involved, when they see they can make so much money right there. A few of them are beginning to learn that that is short-sighted and are trying to get out of it. But it is awfully hard. Once they get in that cycle, it is hard for them to break out.

For example, just recently this year, the two major gangs in Los Angeles, the so-called Crips and the Bloods, decided that it was their own safety at risk. They were afraid of their children being shot and killed and so forth, so they on their own, agreed to try to get together and stop this fighting between the two gangs. Apparently the truce is still holding in spite of many police who didn't think it would. This was even before the recent Los Angeles riots; the two gangs were trying to get together. They were meeting; the leaders were meeting. They had a truce. Apparently that is still holding up.

As I was saying, a few of the youth realize that the gang activity and the selling of drugs is a little short-sighted. But it is very hard to get out of it, out of that group association and so forth.





'First Black' Accomplishments

Morris: Well, I think I have worn you out. What have we missed in the things you wanted to include in this narrative?

Ferguson: To the contrary, I must have worn you out. However, in what they call the "First Black" category, one of the things that comes to mind is that I was the first to get a Ph.D. degree in chemistry from the University of California.

Morris: Did anybody make a special note of that at graduation?

Ferguson: No. I guess it didn't dawn on me for a couple of years. I knew there was an African American ahead of me who got his master's degree at Berkeley. He went to Stanford to get his Ph.D.; I don't know the reason why he didn't follow through to get his Ph.D. here. But I might mention I am the only African American to receive an ACS award in chemical education. Also a statewide outstanding professor award from the Cal State system.

Morris: That's quite an honor, isn't it?

Ferguson: Just luck. I don't associate that honor with being the only black person; it's just that I'm proud to be one of the outstanding professors. To be eligible for that, you have to have won an award from your local university.

Morris: So Cal State Los Angeles had to recognize your--.

Ferguson: I had already won one. Then once you get one from the local campus, then you are eligible for the statewide award.

Morris: Did you feel welcome at Cal State Los Angeles?

Ferguson: Yes, I think the department was very receptive to minorities. As I say, I think the department had an unusually high percentage of minority faculty members. At the same time, I should add, the department has received the largest number of systemwide outstanding professor awards of any department in the system.

All my colleagues were very friendly. A couple of the faculty members--my daughter and their daughters would stay overnight at each other's houses and do things together. We had a lot of social events together. I had no strong feelings against any of them. Of course, those are professional friendships. A couple of those can become quite deep, but usually they are more like acquaintances rather than deep friends.



Morris: The people you work with.

Ferguson: Work with, right. But as I said, our families were quite close with a couple of them.

Morris: How about the people that you studied with and worked with here in your own student days? Any of those friendships still continue?

Ferguson: Yes, one of those, Professor Terrell Hill--he went on to become a professor at UC Santa Cruz--he is outstanding in his field. He was a professor at the University of Oregon and at UC Santa Cruz and has written the classic textbook for his field and so forth. We were studying under G. E. K. Branch together as graduate students. So our families have been very close. In fact, two of the summers that I taught at the University of Oregon, we stayed in his home. He went elsewhere during the summer and we stayed at his house. Our families have visited each other all through the years since. He lives in Santa Cruz and he has been up to visit us in Sacramento. We've been there in Santa Cruz to visit him.

Morris: Well, it's nice to have you back in northern California.

##

Morris: Have you kept in touch with the academic community?

Ferguson: Not really. I've visited the chemistry department over at Sacramento but I'm loafing and haven't become involved in any professional activity, although if asked probably would go visit a high school or something like that to talk to a group of minority students.

I think that one of the things I'm proud of is that, having authored several textbooks, a couple of them have been translated into other languages, Japanese and Hindi. Of course, they are all outdated now. The last one was published in 1975, I believe.<sup>10</sup> But still, I guess I'm the most widely read black chemistry author.

Morris: That's exciting.

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<sup>10</sup> Structural Organic Chemistry, Willard Grant Press, Boston, 1975.



Ferguson: Frequently I go places where people have recognized my name, I mean professionally. "Oh yes, I used that text in graduate school or something like that."

Morris: That way, you influenced really a whole lot of--.

Ferguson: A generation of graduate students, through the fifties, sixties and early seventies.

Morris: You don't keep updating those textbooks?

Ferguson: I did for a few years. The one that came out in 1952 I revised in 1963 and again in 1970, or sometime along then. But, as I say, after a few years they are outdated.

Morris: By then there are enough changes in the whole field that you have to write a new textbook?

Ferguson: Yes. One of the things, I don't know if I mentioned in the stuff I gave you, that was amusing, is that back in the early sixties or late fifties, around 1960 or something like that, at the time University of Mississippi was fighting to keep African Americans out of the school, they happened to be using one of my books as a textbook in the chemistry department, but they didn't know that the author was African American. The publisher wouldn't put my picture on the jacket because some schools might not want to use it, seeing that the author was African American. Mississippi was a case in point.

Morris: Did they keep using your book?

Ferguson: I don't know how many years they used it. Probably two or three. But they never did know that the author was African American. This was called to my attention some time later.

I remember when one of my students went to Yale for graduate work. One his classmates learned that the book that they were using was written by a professor at Howard and asked this graduate student if I were African American. Howard was associated with being a black institution. He was struck by the fact that they were concerned about whether or not the author was African American.

Morris: There have certainly been a lot of changes during your professional life.

Ferguson: Oh, yes.



Morris: Have you stayed involved in University of California alumni activities at all?

Ferguson: Not really. The school has a luncheon, I guess about every year here among students who were here in the Lewis era. G. N. Lewis was dean up until around 1945-6-7, somewhere in there, dean of the college. Beginning in 1912 or thereabouts. So this is a meeting of those who attended the college during that period. I came to one of those. It was very interesting to see a couple of classmates. Of course, a lot of them dated back to the thirties before I was a graduate student.

Morris: I should say so.

Ferguson: So they have those I think every year or every other year. I've only come to one. Maybe I'll come to another now that I'm closer.

Morris: Now that you are within reach. Well, I thank you very much for providing us with all of this information and great ideas on teaching chemistry.

Ferguson: I'm flattered and honored to be asked. Thank you. Good luck in your project.

Morris: Well, I've really enjoyed talking with you.

Transcriber: Christopher DeRosa  
Final Typist: Merrilee Proffitt





## TAPE GUIDE--Lloyd Ferguson

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March 1992

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